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ABSTRACT

Aspects of the interactive environments of 10 emotionally disturbed children (7 to 11 years old) were compared with those experienced simultaneously by 10 normal children (matched for age, sex and IQ) in the same setting. Two types of setting were examined: a choice setting in which the child was able to choose his activity from among several alternatives and a nonchoice setting in which the activity was planned and directed by the teacher. Two trained observers were used to describe the behavior of a matched pair of children (one normal, one emotionally disturbed) in a regular elementary school classroom. The narrative accounts of the observers were delineated into Environmental Force Units (EFU) based on the following six variables: the frequency of total EFU's per observation; the frequency of EFU's per observation initiated by the S; the frequency of EFU's per observation in which the S was the sole target of the EFU; the frequency of EFU's per observation in which conflict was evident between the goals of the agent and the S; the frequency of EFU's per observation in which methods judged to be coercive were employed by the agent; and the frequency of EFU's per observation in which the agent was an adult. Data indicated no significant differences in environmental forces existing between the disturbed and the nondisturbed children and only two differences between the two types of settings. (Author/GW)

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ENVIRONMENTAL FORCES IMPINGING UPON NORMAL AND DISTURBED CHILDREN IN A REGULAR CLASSROOM

Spencer Gibbins

Final Report

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Project No. 1-E-098
Grant No. OEG-5-71-0073 (607)

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May, 1971

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ABSTRACT

ENVIRONMENTAL FORCES IMPINGING UPON NORMAL AND DISTURBED CHILDREN IN A REGULAR CLASSROOM

by

Spencer Gibbins

Chairman: William C. Rhodes

This study examines the interactive environments of children labeled as "emotionally disturbed" and compares aspects of these environments with those experienced simultaneously by "normal" children in the same setting. Two types of settings were examined--a choice setting in which the child was able to choose his activity from among several alternatives, and a non-choice setting in which the activity was planned and directed by the teacher. The study assumes an ecological stance in formulating the hypotheses which revolve about differences occurring in the environmental forces impinging upon "disturbed" and "normal" children who are in the same regular classroom setting at the same time.

The experimental method used by the study, exploratory in nature combines the sophisticated techniques of observation developed by "ecological psychology" for use in everyday settings unmediated by artificial experimental conditions, an instrument for delineating and quantifying environmental forces, and a matched-pair analysis of variance design. In

the study two trained observers were used to describe the on-going behavior of a matched pair of children in a regular elementary classroom. One of the children had been labeled as "disturbed" by the school diagnostic apparatus and the other, matched for age, sex and IQ had never been referred for special services. Ten such pairs of children were observed in both a choice and non-choice setting. These narrative accounts were then delineated into Environmental Force Units which were, in turn, categorized and frequency counts recorded. The categories used for these Environmental Force Units contributed such information as whether conflict occurred with the environmental agent, whether the environmental agent was an adult or peer and whether the environmental interaction was initiated by the child or by the agent. The frequency scores derived from the classification of the Environmental Force Units were then subjected to an analysis of variance to determine to what degree, if any, environmental forces were different for "disturbed" and "non-disturbed" children and whether or not these differences were affected by the nature of the setting.

The results of the study revealed no significant differences in environmental forces existing between the "disturbed" and "non-disturbed" children and but two differences between the two types of settings. The study concludes that inter-setting rather than inter-subject differences are perhaps better studied through this experimental method and suggests other uses for ecological techniques in psychological research and training.

ENVIRONMENTAL FORCES IMPINGING UPON NORMAL AND DISTURBED CHILDREN IN A REGULAR CLASSROOM

by

Spencer Gibbins

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of the requirements for the degree of
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CHAPTER I

STATEMENT OF THE PROBLEM

Introduction

Although the classroom setting is second only to the family setting in terms of its impact upon the behavior of children, very little is known of the environment-behavior relationships existing there (Gump, 1969). Most studies of disturbed children, being "skin-bound," do not speak to the unique contribution of the environment in "disturbing situations." The study of emotional disturbance in children has largely ignored the investigation of the classroom, even though it is in this area where most "disturbance" becomes apparent or identified. In order to study the environment-behavior relationships of the classroom, especially as they affect disturbed children, it would seem most profitable to utilize a naturalistic approach in psychology, to study the child in his natural setting. This viewpoint is a newly emerging one, the assumptions and methodology of which are different from those of the traditional or laboratory perspectives of psychology.

Applied psychology has long been identified as a "clinical" science, deriving its viewpoint and methodology from its roots in the profession of medicine. The medical

concept of pathology and its diagnosis and treatment, within the disturbed individual, was simply couched in new psychological terms. This conception of psychology still dominates the profession. The rise of the learning theorist, or behavioral school of thought, though still not challenging the concept of intrapsychic "pathology," did begin to emphasize the importance of the external environment or contingencies and their influence upon behavior.

Environmental variables are receiving an increasing amount of attention. Sells (1969) states that there are two contextual prescriptions concerning the content of psychology: (a) there is a need for a master plan to place psychological research in a phylogenetic perspective; (b) for every species and class there should be a detailed description and quantitative analysis of the environment and the matching behavior response repertoire. It is amazing how little we know about species and classes of beings outside of "rats, chicks, monkeys, college students, military basic trainees, babies and hospital patients. . . ." Taking psychology and psychological research out of the laboratory and utilizing new observational methodologies in "natural settings" has been the unique contribution of several psychologists who may be loosely organized under the rubric of "ecological psychology."

Ecological psychology may trace its development back to Lewin and his concepts of the force field (Lewin, 1951), and to Brunswik's critiques of carefully arranged experimental research in which contrived experiments distort the relationships of a natural environment by artificially "tying" or "untying"

variables (Brunswik, 1947). Such contemporary ecological psychologists as Barker and Willems borrow a great deal from the fields of biology and ethology in their attempts to study human behavior in an ecologicallly respectable manner. Their emphasis upon observation and man seen always in the context of an ecosystem of some type distinguish them from traditional schools of psychology. This distinction is most sharply apparent in the ecologist's repudiation of traditional, experimental methodologies. Barker's statement that "scientific psychology knows nothing, and can know nothing, about real-life settings in which people live . . ." (Barker, 1969) is representative of his objections to traditional psychology.

Methodology is not, however, the only point of divergence between ecologically-oriented psychologists and those in traditional psychology. The nature of behavior as seen through an ecological perspective takes on new dimensions. The concept of emotional disturbance is a case in point. Most ecological psychologists do not use a medical model of "mental illness," disturbance as a pathology within the individual, but rather see disturbed ecosystems. Sells (1966) speaks of a mismatch between circumstance and species. Disturbance is not seen as bound to the individual, but rather in the interaction of the individual and his specific environment. To understand "disturbance," therefore, one must look at the critical interface of the individual interacting with his environment.

Barker (1955) has repeatedly pointed out the need for more information to be gathered concerning the everyday

activities and influences upon behavior experienced by normal children. Since the school classroom is a major environment for children (both in time spent there and in the myriad of developmental influences found there), a need arises to observe very carefully the resultant behavior in this critical interaction between child and classroom environment, and to try to identify the forces of variables influencing behavior in that setting. Though such study has many implications in and of itself, it would seem even more valuable to compare such data with those data collected for a child labelled "disturbed." By understanding the influences of behavior for both children, one may be able to shape an environment more conducive to child development and one less likely to produce labels for deviance. Before such intervention into the environment may occur, however, one must accurately observe, describe, and identify the environmental forces operating within the environment and the behavior resulting from this interaction between child and environment.

Emotional Disturbance As An Interactive Phenomenon

The newly emerging sector of psychological study based upon "ecological" or "naturalistic" viewpoints contributes more to the study of behavior than merely an emphasis upon environmental study. In addition to offering a new perspective through which to view behavior and a set of methods for naturalistic study, ecological psychology provides very different assumptions regarding causality of behavior. No longer is an individual separated from his environment for the purpose

of diagnosis. All behavior is assumed to be a product of the interaction of the individual and his environment. Such constructs as "mental illness," "emotional disturbance," or "schizophrenia" are of little use to the "ecological" psychologists since they assume individual pathology--a disease entity contained within the afflicted individual. Not only do these terms dictate "clinical" diagnostic procedures but point to the affected individual as the focus for change effects.

Disturbing behavior is viewed as an interactive phenomenon in ecological psychology. Such a viewpoint demands that the disturbing phenomenon be observed or "diagnosed" as it occurs in its natural setting. Barker (1968), Rhodes (1967, 1970) though attacking the problem at different levels, agree that the phenomenon of disturbance cannot be seen, understood or interpreted divorced from its setting.

Implications for intervention generated by such a viewpoint place the environment in a much more critical position. A great deal of "disturbance" can be eliminated by manipulation of the environment--not merely to condition or de-condition the person labelled "disturbed" but to permit a wider range of behavior which is not adversely reacted to by the setting. "Emotional disturbance" is observed and "treated," then, as a disruptive interaction rather than as an "illness."

The Problem

The phenomenon of emotional disturbance in children has been approached primarily from a clinical stance. Though the school forms the setting in which most disturbed children

are identified, diagnosed and treated, little is known of the environmental contingencies operating upon "disturbed" or even "normal" children in the classroom. If one views disturbance as interactive, it becomes critical to carefully observe and compare the interaction of both "normal" and "disturbed" children in the classroom. This study attempted to identify, quantify, and compare the environmental forces operating upon children in regular elementary classrooms.

The study focused upon the environmental forces impinging upon children in the form of behavioral demands made by other persons. Identification and quantification of these environmental forces was achieved through the use of Schoggen's Environmental Force Unit or EFU (Schoggen, 1963). These EFU's were delineated from lengthy and detailed narrative accounts of observations made by trained observers. Two populations of children were sampled--"normal" children and those children who had been labelled as "disturbed" and recommended for special education. Matched pairs of these children were observed in their ordinary classrooms in two naturally occurring situations--one in which the children were engaged in an activity which they had individually chosen to do, and one in which the activity was planned and administered by the teacher. These two types of situations were chosen to investigate the effect of "structure" upon behavior. This phenomenon is cited as an important source of variance by many writers including Gump (1969), Kelly (1966; 1969) and Gump, Schoggen and Redl (1963).

It was the purpose of the study to utilize the instrument of the Environmental Force Unit to obtain a description

of the environmental forces simultaneously impinging upon "normal" and "disturbed" children in the same classroom during "choice" and "non-choice" situations. These descriptions were then used to ascertain if significant differences in the amount and types of environmental forces exist between the two types of children or the two types of settings.

One may then use the categorized Environmental Force Units as descriptors of the forces impinging upon a subject from the environment. This quantified description of the environment may then be used in testing hypotheses concerning the differences found between the environments of children labeled "disturbed" and those who are "non-disturbed."

Definitions For This Study

Specimen record.--A detailed, sequential, narrative account of behavior and its immediate environmental context as seen by skilled observers. The account describes in concrete particulars the stream of an individual's behavior and habitat (Wright, 1967).

Environmental Force Unit (EFU).--An action by an environmental agent which (1) occurs vis-a-vis the child, (2) is directed by the agent toward a recognizable end-state with respect to the child, and (3) is recognized as such by the child (Schoggen, 1963). The environmental agent must be successful in getting the subject's attention at least long enough to communicate his intention. Unless this recognition by the subject of the agent and his intent is adjudged to have occurred by the investigator, no EFV is recorded. The

investigator uses observer comments and subsequent recorded behavior in making this judgment.

"Disturbed Child."--A child who for reason of behavior problems rather than physical anomalies has been referred to a school-recognized diagnostician and has been found by that diagnostician as needing special education services. The child has not, however, been removed from the regular classroom and is considered to be within the "normal" range of intelligence.

"Non-disturbed Child."--A child considered to be within the "normal" range of intelligence, who has no handicapping physical anomalies and who has never been referred for special education services.

Matched pair.--Two children who, in their normal and routine placement, are participating in the same setting simultaneously. One of the children in each pair has been defined as "disturbed," and the other as "non-disturbed." The children are matched as to age, sex, and IQ (within 10 points). The children were matched on these variables since these three characteristics were most accessible for manipulation in the classroom setting and since they are considered very potent developmental factors in determining behavior.

Choice setting.--A school-located activity period which is not pre-planned or structured for the child by another person. Though the specific behaviors engaged in may be structured, the child has several alternative activities in which he may choose to participate (e.g., library period, a "free period").

Non-choice setting.--A school-located activity period which is planned and structured for the child. The child has no alternative but to participate in the imposed activity (e.g., math lesson, reading drill).

The Design

Population sample

Observations were arranged within ten regular elementary classrooms located in three separate school districts diverse in location and population characteristics. The classrooms consisted of one second-grade, two third-grade, four fourth-grade, and three fifth-grade classes, each of which contained a matched pair of subjects selected by the principal of the school. The individuals comprising the ten matched pairs of children were never identified by name to assure confidentiality. Code names were used.

Settings within the classroom

Each pair of children was observed for a period of 20 minutes on two separate occasions. One observation was made in a non-choice setting, an activity of the classroom which is planned and executed by the teacher; this was usually an arithmetic lesson. The second observation was done in a choice setting--an activity which is not pre-planned or structured and in which there is no direct intervention by the teacher. These settings ranged from "free periods" to library periods. During both observations, each of the pair was observed in the same setting simultaneously. The settings

observed were suggested by the classroom teacher.

Data collection

Data were collected in the form of specimen records as developed by Barker and Wright (Wright, 1967) by a team of trained observers taking notes by means of a pocket-sized dictation device. Preparatory to each observation, the entire classroom was informed of the general nature of the observation and familiarized with the equipment and procedures to be used to make the data collection as unobtrusive as possible (Schoggen, 1964). A pair of observers were utilized in each setting, one to record the behavior of each of the subjects in the matched pair. The observers switched subjects half-way through the activity in order to provide a further measure of observer reliability. The observer team recorded the behavior of each matched pair of children in both the choice and non-choice settings.

The notes taken by the observer teams for each setting were then used in constructing the narrative typescript which was then edited and divided into Environmental Force Units by two trained investigators working independently. Comparisons of these independently derived EFU's were made and disputed identifications discussed and resolved.

Once the specimen records were delineated into EFU's, the number of EFU's per child per setting was determined and standardized as to length of observation (Schoggen, 1963):

$$\text{Adjusted N of EFU in Record X} = \frac{\text{Duration of Shortest Record}}{\text{Duration of Record X}} \times \text{Actual number of EFU in record X}$$

(Variable 1)

Two trained investigators, working independently, then categorized each EFU in five ways:

1. Initiation of EFU by Subject or initiation by Environmental Agent (Variable 2).

2. Subject sole target of EFU or Subject one of group target (Variable 3).

3. Conflict between goals of Agent and Subject in EFU or no conflict (Variable 4).

4. Method of Agent in EFU adjudged coersive or method of Agent not coersive (Variable 5).

5. Agent in EFU is an adult or Agent is a peer of the Subject (Variable 6).

The definitions of most of the above categories (hereafter referred to as variables) were taken from a previous study of Schoggen (1963). Variable 5 was defined by this writer.

The data consisted of a total of 40 specimen records--one record per child per setting (10 pairs of children x two settings per pair). Each record was delineated into EFU's and each EFU categorized five ways. It was the number of EFU's per child per setting which became the basic unit or score for that child. Each child had a frequency score for each variable in each setting. For example, Subject A has a score representing the frequency of EFU's initiated by the Subject rather than the Agent (Variable 1) for both the non-choice setting and the choice setting.

Hypotheses

Given an ecological or interactive viewpoint and a recognition of the contribution of the environment to "emotional disturbance," one must postulate that the environment of a child labeled as "disturbed" must have characteristics different from those environments of children not so labeled.

Since children labeled as "disturbed" show less appropriate school behavior than non-disturbed children (Kounin, Friesen & Norton, 1966) one would expect the teacher to exert much more authority in terms of both quantity and style in her interactions with the "disturbed." This would be especially true in classroom situations which she had structured and over which she had complete control. In general, one would expect more interactions between a "disturbed" child and teacher and more interactions with inherent conflict than one would find between a teacher and a "non-disturbed" child. By specifically isolating, describing and comparing the environment in terms of these interactions, one may then be able to better program intervention efforts.

Using the EFU's categorized as to the aforementioned schema, the following hypotheses were tested:

Hypothesis 1.--There will be a significant difference in the number of Environmental Force Units per setting between "disturbed" and "non-disturbed" match-mates in both non-choice and choice settings. The greatest difference between the "disturbed" and "non-disturbed" children in each pair will

occur in non-choice settings. (Variable 1.)

Hypothesis 2.--There will be a significant difference in the number of Force Units per setting which were initiated by the Subject as opposed to the Environmental Agent between "disturbed" and "non-disturbed" match-mates in both non-choice and choice settings. The greatest difference between the "disturbed" and non-disturbed" children in each pair will occur in non-choice settings. (Variable 2.)

Hypothesis 3.--There will be a significant difference in the number of Environmental Force Units per setting in which the Subject is the sole target of the Environmental Agent between "disturbed" and "non-disturbed" match-mates. The greatest difference between the match-mates will be in non-choice settings. (Variable 3.)

Hypothesis 4.--There will be a significant difference in the number of Environmental Force Units per setting in which there is a conflict between the goal of the Subject and of the Agent between "disturbed" and their "non-disturbed" match-mates. The greatest difference will be in non-choice settings. (Variable 4.)

Hypothesis 5.--There will be a significant difference in the number of Environmental Force Units per setting in which the method of the Agent is adjudged coercive between "disturbed" and "non-disturbed" match-mates. The greatest difference will be in non-choice settings. (Variable 5.)

Hypothesis 6.--There will be a significant difference in the number of Environmental Force Units per setting in which the Agent is an adult between "disturbed" and "non-

disturbed" match-mates. The greatest difference between the match-mates will be in non-choice settings. (Variable 6.)

These hypotheses were tested using a three factor analysis of variance design wherein Factor A ("disturbed" - "non-disturbed), Factor B ("choice" setting - "non-choice" setting) and Factor S (matched pair) were each crossed with the other two factors. Factors A and B were analyzed as "fixed effects" and Factor S as a "random effect." Interaction effects between Factors A and B were also analyzed to determine possible multiplicative relationships between the two factors and their relationship to the dependent variable.

Study Limitations

Interpretation of the results of this study should be made with the sampling technique borne in mind. The size of the sample, ten pairs of subjects observed only twice, seems a formidable handicap. However, logistical considerations dictated such size. In order to compensate for this, an attempt was made to utilize schools representative of a wide cross-section of the total area school population. Each of the schools participating might be said to represent different populations: one an affluent suburban area, another an upwardly mobile working class area, and the third a small rural district.

The two half-hour periods of observation used were executed to secure a sampling of the child's school day. Though the class was introduced to the observers, the observations did not begin until the presence of the visitor seemed to lose its novelty. The teacher was not told who was being

observed so as to assure her unbiased participation. The observers themselves were not told which child was "disturbed" and which was not.

The "disturbed" children in the sample were chosen by the participating principals. Though this seems to introduce a confounding variable, descriptions of the referral behaviors of the subjects were obtained to describe the sample. It was felt that "disturbed" in this study was to be defined by the school and its official labeling process, and therefore the sample was selected by the school. The range of behaviors labeled as "disturbed" remains a source of possible misinterpretation in all studies utilizing more than one subject.

CHAPTER II

LITERATURE REVIEW

Ecological Research In Psychology

The description and analysis of environmental variables in natural settings has been a major thrust of a relatively new branch of psychology to which the rubric "ecological" has been afixed. Though not always easily differentiated from other types of psychological research, its unique contribution has been to emphasize the interactive nature of all human behavior with its setting. Its impact upon the field, though just now beginning to be felt, may be traced historically and logically to writers in the fields of anthropology (Benedict, 1934; Mead, 1930; Frazer, 1913), ethology (Ardrey, 1966; Lorenz, 1966), biology (Dubos, 1965) and sociology (Park & Burgess, 1925; Caven, 1928; Hawley, 1950; Odum, 1953). This review is, however, limited to those writers speaking from a psychological perspective.

Many "classic" psychological studies have directed their efforts at ferreting out environmental influences upon behavior in the age-old nature-nurture controversy (Skeels & Dye, 1939; Spitz, 1945, 1947; Jenkins & Brown, 1935). The above mentioned studies of child development were primarily concerned with the effect of the immediate environment upon

learning or development. Stimulus deprivation was the key variable studied. Other studies, however, took a more molar or epidemiological approach to the problem of environmental influence. The early studies of Jenkins and Brown (1935), Faris (1938), and Faris and Dunham (1939) revealed correlational linkages between such psychological phenomena as intelligence and mental health with such social variables as socio-economic level, type of neighborhood and family stability. These epidemiological studies are representative of a great deal of research showing a relationship between social system organization and such psychological "pathologies" as mental illness, alcoholism, delinquency and marital discord (Anderson, 1923; Zorbaugh, 1929; Shaw, 1929: Shaw & McKay, 1931; Sonequist, 1937; Hollingshead & Redlich, 1958; Fried, 1965).

The Midtown Manhattan Study was undertaken in 1952 to investigate the relationship between mental disorder and the sociocultural environment (Langer & Michael, 1963). In its two volume report (Srole, et. al., 1962; Langer & Michael, 1963) a vast amount of data was assembled showing positive correlations between sociocultural setting and stress situations with mental disorder. The study is also significant in that it was performed jointly by psychiatrists, Rennie and Michael, and sociologists, Langer and Srole. This synthesis of social psychology, sociology and biology is often called "Human Ecology" and is well summarized by Theodorson (1961).

A psychologist dealing with social systems but using infra-human subjects (rats) is an interesting bridge between these epidemiological studies and manipulatible research.

Calhoun (1948; 1960; 1962; 1967) in his studies of population density and its behavioral effects has shown strong linkages between crowding or population density and such individual deviance as withdrawal, homosexuality and the devouring of offspring. Though the leap from rat to man in the generalization of results is susceptible to all the barbs generally given to "rat psychology," the import of the results is most interesting and not lightly dismissed when viewed in light of the above mentioned epidemiological studies.

These studies in social psychology provide a base for further exploration of the interaction of man and settings. Though they are too global in nature to deal with individual differences or to suggest psychological interventions, a sociologist has utilized epidemiological methods in describing individual children and their interactions with school and community. Mercer (1965) describes the relationship of the environment and its labeling devices to children called "retarded." It contrasts the clinical or medical model of retardation with a social system perspective and reveals school labeled retardates as role-players in a system rather than as afflicted individuals.

Still a step further along in their concern for individuals rather than in a "systems approach" is the work of Proshansky et al., at City College of New York (Proshansky, Ittelson & Rivlin, 1970). While these experiments deal primarily with environmental half of the interaction, they do study the interactive effect rather than limiting themselves to behavioral contingencies. Their work, Environmental Psychology

(1970) reports these experiments in measuring behavioral change as the result of the manipulation of the physical environment. It also, however, provides a liaison between this work and the earlier work of the epidemiologically-oriented studies which deal with social conditions on a molar rather than molecular level. It provides a link between the epidemiologists and those primarily concerned with the unique individual in his natural setting--the "ecological psychologists."

Contemporary studies of "ecological psychology" trace their lineage to the work of Brunswik and Lewin (Barker & Wright, 1955). Brunswik (1947) defined ecological psychology as the study of the relationship of behavior and its non-psychological context. It is the word "relationship" which sets these studies apart. The interactive nature of behavior is consistently stressed. Behavior is seen as a result of the interaction of a psychological entity, man, and his non-psychological setting, environment. Lewin (1951) spoke of the interaction of psychological and non-psychological realms in his "force field analysis" methodology. It was from Lewin and his emphasis upon social influences on behavior that Roger Barker, the most prolific proponent of ecological psychology, took the underpinnings for his theories and methodologies.

A major contribution of Barker to the field lies in his concept of observing behavior within its natural setting. This has become a cornerstone of ecological psychology. Barker's thrust away from the laboratory in an attempt to learn how people behave in their everyday lives was exemplified in his early writing in which he designated his concern as one

of psychological ecology. Barker states that:

> Psychologists know little more than laymen about the distribution and degree of occurrence of their basic phenomena: of punishment, of hostility, of friendliness, of social pressure, of reward, of fear, of frustration. Although we have daily records of the oxygen content of river water, of the ground temperatures of corn fields, of the activity of volcanoes, of the behavior of nesting robins, of the rate of sodium iodide absorption by crabs, there have been few scientific records of how human mothers care for their young, how teachers behave in the classroom (and how the children respond), what families actually do and say during mealtime, or how children live their lives from the time they wake in the morning until they go to sleep at night. (Barker, 1968, p. 2.)

The emphasis upon the study of man within his natural setting is also the subject of other writers (Gump & Kounin, 1960; Gump & Sutton-Smith, 1955). Sells (1963, 1969) discusses his theory of the "ecological niche" which represents the adaptive match between circumstances and species schema. He cites the need for a master plan to place psychological research in phylogenetic perspective. Such a plan would contain "a detailed description and quantitative analysis of both the features of the environment defining the ecological niche and the matching behavior response repertoire." (Sells, 1969, p. 20.)

> Considering the aspirations of psychology as a systematic science, it is sobering to consider (a) how little we know of species outside of rats, chicks, monkeys, college students, military basic trainees, babies, and hospital patients, and (b) the limited and ecologically distorted strategies and conditions we typically use to study them. (Sells, 1969, p. 19.)

Edwin Willems (1969) speaks to this need for "naturalistic research" in a description of the definition, considerations, issues, and purposes of such research. Willems sees

naturalistic research as tending toward a low manipulation level of the experimentor and a low level in the imposition of units for measurement purposes.

Willems (1965; 1967; 1971) believes that "ecological psychology" is not, in fact, a distinct discipline but rather a set of "orienting attitudes" which may be useful to all psychologists. Some of these ecological attitudes might be summarized as an appreciation for the complexity of behavior and its interrelationship with setting, the value of independent observation and in "openmindedness" in investigative perspective.

A major step in accomplishing the goals of naturalistic research was accomplished when Roger Barker established the Midwest Psychological Field Station in Oskaloosa, Kansas (Barker, 1969). Here was provided a natural setting into which as little intrusion as possible was made by Field Station staff. After 20 years of quiet assimilation into the community, Barker, Wright and their students observed and recorded the everyday lives of the population of this rural community. Here also Barker developed his ecologically-oriented construct of a "behavior setting" (Barker, 1968). In perhaps an oversimplified definition, a behavior setting consists of a geographically definable and easily delineated milieu or setting which encompasses a standing pattern of behavior similar in structure to the setting. For example, a football game is a behavior setting since it does have distinguishable boundaries and encompasses a recurring pattern of behavior congruent with its physical limits. By the same

rationale, a drugstore, dining room, PTA meeting or classroom are behavior settings.

The "mapping" of behavior settings in Midwest became a major portion of Barker's work and the theory and methodology involved in the process comprise the main part of his book, Ecological Psychology (Barker, 1968). Even in retirement, Barker is pursuing his development of use of the "behavior setting" as an ecological unit. He is presently examining the behavior settings of several small communities to be flooded out by the creation of a man-made lake. The study will compare these settings with those established or modified in the communities in which the population is relocated (Barker & Gump, 1970).

Another common device used to learn about behavior in its natural setting was developed by Barker and Wright--the "specimen record" (Barker, 1963; 1969; Barker & Wright, 1951, 1955; Barker, Wright, Barker & Schoggen, 1961; Barker & Wright, 1949, Schoggen, 1964; Wright, 1967). The "specimen record" is simply a detailed narrative account of an observation taken over a clearly delineated period of time. "Specimen records give a multivariate picture of the molar and molecular aspects of behavior and situation. They preserve the continuity of behavior and save for study interrelations between simultaneous and successive conditions. They present undissected specimens of behavior and psychological situations" (Wright, 1967, p. 33). One Boy's Day (Barker & Wright, 1951) is an example of a specimen record covering one day in the life of a boy in the Midwest. In it one reads of every activity and

every verbalization directed to or from the subject. The observer is allowed to interpret mood and intent within certain guidelines and the polished record becomes a readable and image-provoking recapitulation of the subject interacting with setting.

The specimen record may then be analyzed by various methods. Students of Barker devised a multitude of criteria for dividing records into segments or units for analysis and comparison. Dickman (1963) used specimen records in an experiment to determine whether independent readers of such records would demonstrate significant agreement on the general patterning or identification of "units" of behavior. Though the results showed poor agreement on identical incidence of units, agreement was reached on the meaning of the sequence.

Dyck (1963) divided specimen records into "social contracts"--units of social interaction containing one subject, one agent, one raison d'etre and one continuous topic. Through the identification, tabulation and comparison of such units, Dyck was able to make quantitative statements about naturally occurring social phenomena. He described the interaction of children with their parents at home in terms of frequency of contact, initiation of contact and ritual-relatedness of contacts. His finding supported the not-surprising hypothesis that mothers interact more frequently with children than do fathers but also shed light upon the contacts by comparing frequencies in different types of situations and in different settings.

Other methods of analyzing specimen records include "disturbances" (Fawl, 1963) and "episodes" (Jordan, 1963; Gump, Schoggen & Redl, 1963). Schoggen (1963) developed the Environmental Force Unit (EFU) which will be discussed more fully subsequently. All of these units developed to implement analysis and use of specimen records were defined by the individual investigators and independent raters checks made to ascertain reliability.

Not all studies flowing from the work of Barker use the specimen record, however. Using Barker's rationale for naturalistic observation, Bettye M. Caldwell (1969) and Caldwell, Honig & Wynn (1967) have devised a method for translating data from records of behavior in situ into a numerical code suitable for computer summarization and analysis. The APPROACH method (A Procedure for Patterning Responses of Adults and Children) has developed a coded list of 1) behaviors likely to be emitted by young children and adults who interact with them, and 2) the settings in which these behaviors might occur. Five digit numerical statements representing these factors are recorded by the observer. The data can then be sorted and tallied through the use of key words. This technique is still in exploratory stages and no definitive studies have yet been reported.

Ecological Studies Of Children

Much of the thrust of ecological research has been directed toward children and youth in their natural settings. The earliest and most comprehensive of the ecological studies

done by Barker and his colleagues was centered around children. Midwest and Its Children: The Psychological Ecology of an American Town (Barker & Wright, 1954) reports both a detailed description of ecological methodology and the results of observations made through the Midwest Psychological Field Station. Extensive use was made of behavior setting mapping and specimen record compilation. This study has become a model or classic prototype for efforts in ecological psychology ranging from the establishment of field stations to the observation of children.

The goal of the study was to describe the psychological living conditions and behavior of the children in the town of Midwest and of some children with physical handicaps living in neighboring communities. Midwest was a small rural community in Eastern Kansas of 721 people in 1951/52 and study of the results should be interpreted with those parameters. While it is impossible to summarize all the study's extensive results, the following are representative of their range and nature.

It was found that 585 community settings existed and that infants participated in 60% of them. This range of activity increased to nearly 79% of the settings by adolescence. The behavior objects used by children during a day numbered from 1,882 to 2,490 while the peak rate of objection transactions occurred in the middle of the day. The number of things a child did during a day, according to a criterion of behavior episodes, varied from 500 to 1,300, with the duration of episodes ranging from a few seconds to 121 minutes. Seventy

percent of them were shorter than 2 minutes, however. Age of the child was determined a criteria factor in amount, duration and nature of these episodes.

Examination of the social interaction of children revealed that "children lived their days with adults in a benevolent autocracy"(Barker & Wright, 1954, p. 467). Relationships with other children, however, were not authoritarian in nature but rather were dominance patterns met by counter-dominance. The children "generally gave what they got from all others in affection, mood, and evaluation." The most frequent single kind of social interplay was a friendly interaction short of cooperation which occurred in 60% of 100 episodes. Discord short of conflict occurred in 25 of 100 episodes and in only 5 of 100 episodes did children get into outright conflict with associates. On the other hand full cooperation was recorded in only 1 episode per 100. Age again was found to be a critical variable.

> With increase in age of children there occurred: a gain in the complexity of social partners as shown by an increase in groupings of 2 or more individuals as associates; a decrease in the frequency of adults and especially of parents as associates; an increase in child associates . . .; an increase in the amount of power and in fluctuation of power . . .; a definite power gain in interactions with other children . . .; an increase in harmonious relations and a decrease in conflict with other children, and a decrease in conflict with adults. (Barker & Wright, 1954, p. 470.)

In summary the data yielded by the Midwest study is probably the greatest amount of information concerning the everyday lives of children available. Its rural Midwestern origin is, however, a great limitation in generalizing about contemporary children.

"Streams of behavior," as specimen records are sometimes called, were also used in much the same manner as in Midwest in England (Barker & Barker, 1963; Schoggen, Barker, & Barker, 1963). Specimen records were collected in 51 behavior settings of a small rural community in England and compared with those taken in 51 settings in Midwest. A method utilizing a standard biological field procedure was used in delineating a large behavior unit, a "social action." The presence of social actions in behavior settings was tallied as well as qualitative categorizations of them made. The results were summarized by the statement that ". . . most of the social actions were common to the behavior streams of the American and English children, and that they did not differ in their breadth of distribution across the American and English settings. The social life of American and English children is, according to our data, basically the same. The differences are differences of emphasis" (Barker & Barker, 1963, p. 159).

The structural characteristics of these behavioral streams in the cross-cultural study were then examined (Schoggen, Barker & Barker, 1963) by means of the "behavior episode" unit. Episodes were tabulated and then categorized as to nature of initiation and termination. Results of the study reinforced the conclusions of Barker and Barker (1963) that the differences in the behavior streams 1) were few, 2) were more related to dynamics than to structure and 3) their locus resided relatively more often in the American child and relatively more often in the English environment.

In an approach somewhat dissimilar to Barker, James Kelly (1966; 1969) has concentrated his efforts upon the study of adolescents in "fluid" as opposed to "constant" high schools. The former type of high school is characterized by 42 percent of the entrants leaving during the school year and the latter by less than 10 percent of the entrants leaving during the year. He selected observation sites within the schools with the chief criteria being a high probability of representing effects of population change. Each site was classified along an "Environment-Personal" dimension and a "Public-Private" dimension. Utilizing data gathered from the observations (slightly different methods were used for each site) and data gathered through interviews, Kelly was able to compare student class structure, status criteria, variability in behavior and qualitative differences in behavior between the two schools. His hypothesis that the fluid environment would contain much more variability in behavior, different style of communication, less rigidity in social structure and even a different administrative style were supported.

Kelly's study is similar to an earlier one done by Barker and Gump (1964) entitled Big School, Small School. In reality a series of studies, Big School, Small School reports the findings of the investigators in high schools ranging from an enrollment of 35 to one of 2,287. The most crucial studies were made comparing high school juniors in four schools of 83 to 151 students with those in a high school of over 2,000 students. The schools were homogeneous in regard to economic cultural and political region. Both specimen records and

behavior setting mapping techniques were used in addition to an activity questionnaire. The large and small schools were then compared across multiple dimensions.

One of the major findings of the report was concerned with student participation in school activities. It was reported that the proportion of students participating in extracurricular activities in small schools was 3 to 20 times greater than in the large school. The small school students participated in greater numbers and more varieties of activities than did large school students even though the large school provided a larger number and greater variety of non-class behavior settings. The satisfactions expressed by the two groups of students were different with small school students reporting rewards from the development of competence and being involved in activities while large school students gained satisfaction from vicarious activities and large entity affiliation. Students of small schools also reported more attractions and pressures toward participation in school non-class behavior settings than did large school students.

Because of technical reasons, most of the study's findings referred to non-class activities, but a study of school structure revealed that formal educational behavior settings constituted about the same proportion of the settings of schools of all sizes. Barker and Gump (1964) summarize their findings by stating that their data and their own educational values dictate that a school be sufficiently small so that all of its students are needed for its enterprises. "A school should be small enough that its students are not

redundant" (Barker & Gump, 1964, p. 202).

Paul Gump (1967, 1969) again utilized the construct of the behavior setting in his study of a third grade classroom. Specimen records of the teacher were also taken and divided into "segments" or naturally occurring constellations or patterns (i.e., small reading group activity, class lecture, etc.). Every segment was seen to have a site, an object and an activity pattern consisting of (a) the nature of the teacher's participation, (b) the grouping of pupils, (c) the prescribed action relationships between pupils, (d) the kinds of actions taken by the pupils and (e) the pace of pupil action (Gump, 1969).

Six third grade classrooms served as target populations and observations made for two days in each. The obtained "segments" were then compared systematically across the above dimensions. Gump found that pupil involvement reached 92% in externally-paced small group segments (reading circle) as opposed to 72% involvement for self-paced groups (seatwork). The phase of the segment also seemed to be a critical variable, pupils becoming more involved as the activity progressed. Teacher "acts" were delineated in the records and used as units of teacher behavior. An "act" is the shortest meaningful bit of behavior directed toward children, usually one sentence statements such as "All right, open your books!" Teachers averaged 1300 acts per classroom day. One of the more revealing conclusions of the study revolved about "acts" classified as "Dealing with Deviating Behavior." Such acts seemed heavily concentrated in "transition" periods or those activities which

close down one segment and set up another. It is during these "transition activities" that "pupil behavior becomes more individual and some of the individualism involved behavior divergent from that desired by the teacher. She responds by increasing pressure, countering and rejecting moves . . ." (Gump, 1969, p. 218). The transition activities then would seem to constitute a fertile area for further study.

Preschool children have been the focus of a series of ecological studies conducted at the Demonstration and Research Center for Early Education at George Peabody College for Teachers. Maxine Schoggen (1969) has collected data to provide a library of specimen records on the behavior of 24 three-year-old children from three different socio-economic populations: low-income urban, low-income rural and middle-income urban. The specimen records were divided into Environmental Force Units and the rate of EFU's computed for each child. The percent of EFU's in which the mother acted as agent was determined but no cross-group statistical measured used. These records, however, have provided the data for several other studies. Some of these data have also been used in a "resource" book, Children Learning (Shaw & Schoggen, 1969) to be used in training adults to work with children. Brown (1969) used specimen records taken in the homes of three-year-old children from three distinct socio-economic backgrounds: low-income urban, low-income rural, and middle-income homes. "Behavior objects" were identified from specimen records covering 90 minutes of the child's home life. "Behavior objects" were defined as a commonly discriminated part of the physical-

social environment which is perceived as necessary or appropriate for a particular behavior (Brown, 1969). Both a frequency count and a classification scheme were used. The study concluded that children from lower income homes as compared to a middle income home dealt with fewer different objects, were engaged in more behavior with their mother, were provided with fewer nutritional objects, exhibited less verbal behavior and more motor behavior, and used objects according to their intended purpose less often.

Ecological Studies Of "Disturbed" Children

Though studies involving populations of children who have been labeled as "disturbed" have been performed using ecological methodologies, few of the settings in which the children were observed included the school. Gump, Schoggen & Redl (1963) analyzed the behavior of a "disturbed" boy in a camp setting and then at home using the specimen record technique of observation. Two days of observation, one day at camp and one day at home, comprise the data. The specimen records when divided into episodes (Barker, 1963) were then compared with the following results:

1) A much wider variety of behavior settings existed at camp, many designed for children. The subject engaged in active, exploratory, constructive play at camp and in dallying and formally competitive play at home. More strongly positive and ambivalent emotionality occurred at camp.
2) Camp associates when adults extended to the subject

> more interest-centered, less aggressive and less resistant social behaviors. Peer associates at camp were on a more equalitarian social relationship than at home.

Many similarities in home and camp were also found in a somewhat similar play pattern, the dominance of adults and the discovery that the subject dominated weaker youngsters in both settings. This study, limited as it is with a population of one, is an attempt to begin to explore scientific methods of selecting and designing settings rather than to test a hypothesis.

Jordan (1963) used the behavior episode taken from specimen records to investigate the behavior of two eleven-year-old boys in a ward of a residential hospital for disturbed children. Observations were made for half hour intervals over a period of four months during tutoring sessions with a special teacher. Some of the observations were done under a policy that the subjects must stay in the tutoring session but could do what they pleased, and some were done under the condition that they need not attend the session but if they did they must do work relevant to the tutoring objectives. The two conditions did not show significant differences in the number of episodes for each child per session nor did it have effect upon episode initiation, termination or maintenance. When a comparison of the episodes was made with data from the Midwest children of Barker and Wright (1955), striking similarities were found. These were attributed to the effectiveness of the hygenic milieu approach (Redl & Wineman, 1951) used by

the hospital. The effect of the change of educational policy seemed only to limit variation in the spontaneity of episode initiation--more were initiated by the teacher.

In a different type of study, Raush, Dittman and Taylor (1959a; 1959b) described the social behavior of a small group of hyperaggressive boys and analyzed changes in such behavior over a period of one and a half years in residential treatment. An interaction analysis code modified from Freeman et. al. (1951) and Leary (1957) was used in the analysis. The results on the study simply described the patterns of behavior discerned. Raush, Farbman and Llewellyn (1960) replicated the study but introduced a control group of boys matched as to age and race but drawn from the regular public schools and only temporarily housed in the residential setting. The same observations and coding procedures were utilized for each group of six and an information transmission analysis used as a statistical measure of significance. The results were summarized as follows:

1. Although the disturbed boys, at the later treatment stage, differed from normal boys in some aspects of behavior toward adults, they came to act much more like the normal children than they had early in treatment. The changes in the patients were not paralleled by differences between older and younger normal children; changes in the patients; relations with adults were, therefore, judged attributable to treatment, rather than age, per se. Similarly, in interactions with peers, increase in appropriateness of social responses seemed related to

treatment rather than to age changes. In several aspects of behavior toward peers, however, the disturbed children had failed to change appreciably; control data showed that the lack of change could not be attributed to lack of disturbance.

2. As compared to the ten-year-old normal boy, the normal boy approaching twelve seemed to be progressing toward relations of greater status equality with adults. In contrast, the hyperaggressive children, who in the early stage had shown relatively little overt dependent behavior, had come to exhibit increased dependency toward adults, approaching normal age-mates in this respect. The results implied the dissolution of a defensive counter-dependency toward adults, approaching normal age-mates in this respect. The results implied the dissolution of a defensive counter-dependency through treatment of the disturbed children.

3. The behavior that the children received from peers closely paralleled the behavior they directed toward peers. Although the adults' behavior toward the children was related to the behavior they received from children, the adults produced a far lower proportion of hostile actions than they received, particularly with the disturbed children. The implications were that the forces for change in social behavior derived from adults. A more general implication questions the presumption of a constant

social environment through which the individual acts while the world around him remains the same. The data suggests rather, a reciprocal process in which the person's effects on others and other's effects on him are in continuous dynamic interchange.

4. Information transmission analyses showed that the normal children varied their behavior in accordance with the specific social setting. The normal children tended to differentiate among social settings more than did the disturbed children. In their actions normal children also distinguished between their peers and adults to a greater degree than did the patients. The results suggest the relevance of concepts relating differentiation to psychopathology.

5. The social setting seemed a more potent determinant of affectional relations than of status relations, whereas the status roles of the participants seemed more relevant to status relations than to affectional relations. In all groups individual differences tended to be greater in relations with peers than in relations with adults; this suggests that a group may be more stereotyped toward other-status recipients of action than it is within its own members.

6. Normal and disturbed children showed, in general, the same behavioral tendencies toward specific settings. Food settings were associated with relatively friendly

actions for all groups, and competitive games were associated with unfriendly behaviors.

7. As had been true for the disturbed children, so for the normal children, too, the interactive effects between child and setting contributed far more information about the behavior than did the sum of the independent components. Thus, it would seem that the kind of behavior a setting evokes would be to a considerable extent related to the dimensions of the particular situations that are salient to him, and that this is true for both normal and disturbed children.

8. In general, the two normal groups resembled each other in their response to different settings. There was a suggestion that, in an informal setting, older children, as compared with younger children, may be freer to express hostility toward adults and more controlled in relations with peers.

Kounin, Friesen & Norton (1966) used videotapes in an attempt to delineate some dimensions of teaching styles that affect emotionally disturbed children in grades 1-2 and 3-5 in regular classrooms. Data were drawn from 30 classroom for 1/2 day each. Scores for deviancy and work involvement were obtained for both "disturbed" and "non-disturbed" children. The results indicated:

1. Pupils' scores vary between seat work and recitation settings.

2. Disturbed children exhibited less school-appropriate behavior than non-disturbed children.

3. Teachers who are successful in managing the behavior of non-disturbed children are also relatively successful with disturbed children.

4. Techniques of handling misbehavior do not always correlate with the children's behavior.

5. Teacher attitude, technique in handling group movement, and programming for variety change in learning activities do correlate with children's behavior.

Other discussions of ecologically-oriented interventions have appeared (Kelly, 1970), but have been theoretical rather than functional in nature.

Though ecological psychologists have labeled their studies purely descriptive and usually avoided the formulation of theory, an ecological theory concerning disturbance and "disturbed children" is proposed by Rhodes (1967). In this view "disturbance" is seen as a reciprocal exchange between a child perceived as deviant in thought, word or deed and the reacting environment. Such a viewpoint would preclude a physiological or psychodynamic "gremlin" approach and would tend to place more emphasis upon bringing pressures to bear upon the environment rather than upon the "offending" child. Rhodes further develops this thesis in describing the role of the "community" in disturbance (Rhodes, 1970). Citing ecological studies of ethologists in which creatures deviant

in odor or appearance incite mayhem in the colony (Lorenz, 1966; Calhoun, 1962), Rhodes compares this community reaction to its human counterparts. Again the conclusion is reached that ecologically oriented approaches to the problems of children must be undertaken in order to successfully overcome them, and the intervention must deal with both the child and the environment.

> The time has come to begin to concentrate attention upon changing the ecological conditions under which children have to live and grow, and thus reduce the number of occasions of disturbance and the number of children who are extruded or alienated from their living units. (Rhodes, 1970, p. 313.)

Methodological Concerns

The study of children in natural environments requires methodologies and techniques quite unlike those appropriate for the laboratory or traditional experimental-manipulation-of-variable models of research. New methods of data collection and analysis are still in the process of evaluation by some ecological psychologists.

The chief data gathering technique in ecological psychology is that of the specimen record. The basic procedures for learning this technique are enumerated in Recording and Analyzing Child Behavior (Wright, 1967). These include instructions as to observational period, note-taking, timing, dictation and revision. The observer is given the following rules of reporting. (These will be used in this study.)

1. Focus upon the behavior and the situation of the subject.
2. Observe and report as fully as possible the situation

of the subject.

3. Never make interpretations carry the burden of description.
4. Give the "how" of everything the subject does.
5. Give the "how" of everything done by any person who interacts with the subject.
6. Report in order, all the main steps through the course of every action by the subject.
7. Wherever possible, state description of behavior positively.
8. Describe in some detail the scene as it is when each behavior setting is entered.
9. Put no more than one unit of molar behavior in one sentence.
10. Put in one sentence no more than one thing done by a person in the situation of the subject.
11. Do not report observations in terms of time intervals.

The use of mechanical aids for making specimen records is described by Schoggen as developed for his studies (Schoggen, 1964). The use of a mask-like device and tape-recorder as described would seem to expedite both the utility and efficacy of the specimen record as a data gathering device. Barker (1969) also considers the field station as an important tool to be used in naturalistic method of psychological research.

The division of the "stream of behavior" as captured by the specimen record into smaller units for analysis has been enumerated in a previous section. The "Environmental

Force Unit" (EFU) developed by Schoggen would appear to be a very viable tool in assessing the influence of setting upon environment. An EFU is defined as an occurrence of action initiated upon the child, directed toward some end, and of which the child was aware (Schoggen, 1963). Utilizing these units he was able to show how the EFU's were distributed in each setting, how long they lasted, who the agents involved were, how they conflicted with the child's wishes and to what end the actions were directed.

Simons & Schoggen (1963) utilized the EFU in studying mothers and fathers as sources of environmental pressure on children. The EFU containing conflict and involving either mother or father were utilized from the specimen records of eleven children. The numbers of EFU and conflict EFU were tallied as well as the method and the number of methods used (as defined by the investigator). No statistical methods were employed to determine significant differences. Only the percentages were listed.

Schoggen's initial study (Schoggen, 1963) in which the EFU was developed utilized 18 specimen records, the following criteria were examined: duration of EFU; rate of EFU; age and role of agent; conflictual EFU; methods of agents (27 were identified) and the goals of environmental agents (29 were identified). Inter-rater reliability was utilized to provide some measure of objectivity in the assignment of EFU's into the various categories created by Schoggen.

After the design and methodology for this study had been formulated, an unpublished study of Schoggen (1968) was

found which may be considered a parallel. In it, specimen records were collected for matched pairs of children in classrooms and at home. One child in each pair had a clearly visible peripheral motor impairment and one did not. The same observer, however, watched both children in the pair on successive days. Environmental Force Units were delineated and categorized. The following, rather surprising results were indicated:

1. Other persons reached out or responded to children with disabilities neither more nor less frequently than to non-disabled children.

2. In general, children with disabilities were not singled out for special individual attention more frequently than non-disabled children.

3. Intervention by others in the ongoing activities of the child, "butting in," tended to occur more frequently in the associates of disabled children, but the trend was not statistically significant.

4. Attempts to benefit the subject in some way did not, in general, occur more frequently with the disabled.

5. Conflict between subject and associates occurred neither more nor less frequently for the disabled.

6. There was no evidence that other persons gave more freely of time and energy to the disabled.

7. Demands for the subject to carry out an activity occurred as frequently for the disabled as for the other subjects.

This study of the disabled by Schoggen is one of the few ecological studies which approach an experimental design. Most studies in "ecological psychology" are of a purely descriptive nature.

In summary, the area of "ecological psychology" is still in the process of "becoming." Whether it develops into a full-fledged interactional theory with its own vocabulary, constructs and methodology a la Barker or becomes a perspective or viewpoint re-shaping traditional psychological research as with Willems, has yet to be determined. This process of unfolding, however, has to date, limited research efforts to purely descriptive studies. More experimental models of research may develop in the future but not before specific facility-operation problems are resolved. Barker (1969) enumerates three such problems: (1) an archival problem, or the accumulation of raw observational data; (2) a field station problem, the paucity of vantage points from which to view natural human behavior in an unbiased manner; and (3) an analytical problem, the development of measures and techniques to analyze without destroying the value of the phenomena observed. He concludes, "These pro'lems are great, but the possibility of arriving at scientifically meaningful and socially useful results are also great, and they justify the commitment of intellect, effort, and money to the task" (Barker, 1969, p. 41).

Synthesis and Application

The review of the literature reveals a collection of disparate studies whose relationship one to another often seems limited to the word "ecological" found somewhere in the title. Psychologists enter their "ecological" studies with diverse backgrounds and theoretical viewpoints--from clinical psychology (Brunswik, 1947; Raush, Dittmann & Taylor, 1959a; 1959b); sociology (Fried, 1965; Langer & Michael, 1963), experimental psychology (Calhoun, 1967; Proshansky, et al., 1970), community psychology (Kelly, 1966; 1969) and more esoteric specialities. The studies of "emotional disturbance" in particular indicate very different assumptions underlying the concept of "disturbance" or its definitions. One encounters unstated but evident psycho-dynamic theory in the work of Raush, Dittmann and Taylor (1959a; 1959b) while the "disturbance" seen by Kounin, Friesen & Norton (1964) or Rhodes (1967; 1970) has a much more distinctive sociological aura as found in labeling theory. The studies, themselves, involve widely divergent populations, from rats in a laboratory (Calhoun, 1967) to the population of entire communities (Langer & Michael, 1963; Barker, 1954). While some authors attempt to lay a foundation for a new body of theory with which to determine the parameters of "ecological psychology" (Barker, 1968; Rhodes, 1967; 1970), others declare ecological psychology to be a point of view or perspective which can be utilized by orthodox behaviorists, clinicians or by other disciplines (Willems, 1967).

While the diversity and seeming unrelatedness of much of the literature may boggle the mind, at least four common themes or issues may be gleaned from this survey. These themes serve as the justification for this study and the viewpoint from which it may be interpreted:

1. The importance of observing human behavior in its natural setting;
2. the focus of the psychologist upon the interactive nature of behavior;
3. the influence of setting upon behavior;
4. the attempt to develop a methodology which will objectify and quantify observational data.

Nearly all of the writers, somewhere within their study, emphasize the importance of understanding human behavior in the context of its natural environment. With the exception of Calhoun, all studies concentrated upon gathering data in as unobtrusive a method as possible in the normal habitat of the subject. The assumption that human behavior can best be understood in its naturally occurring context is basic to this study. Flowing from this is the assumption that effective intervention techniques can best be developed using natural environments rather than laboratory settings or artificial behavior (as in testing).

Of the studies reviewed, virtually all were concerned with observing, recording and analyzing the interactive components of behavior. This interaction may be between subject and physical setting or subject and the complex described as "behavior setting" (Barker, 1968). In either

case, the examination of intra-psychic dynamics or of the nature of the environmental contingencies is made subordinate to the dynamics of interaction between subject and all aspects of setting. The interpretation of this interaction may be made in behavioral, psychodynamic, sociological or biogenic terms but an attempt is made to capture the nature and efforts of the interaction as completely as possible.

Though an interactive focus is evident in the studies cited, all emphasize the heretofore underestimated influence of setting upon behavior. This powerful influence is seen as not limited to the rewarding or punishing environmental contingencies, but is viewed in a broader context. Barker (1968) seems to sum it up well when he states that one may more effectively predict a person's behavior at a football game by understanding the setting than by garnering vast amounts of test-derived or case-history related information. Even if somewhat oversimplified, the point of the statement, that setting is too often overlooked in examining behavior, is another primary assumption for this study.

Though nearly all of the studies cited viewed themselves as purely descriptive in nature, none followed the traditional psychological data-gathering devices of testing, interview or case history. Observation is the primary method in these studies. All, however, make an attempt to depart from traditional subjective and intuitive "skills" in recording and analyzing data. The use of inter-rate reliability tests and the development of categorical schema for quantifying observational data represent an attempt to study behavior

holistically while describing results in as objective and replicable a manner as possible. Though many hazards are found in the attempt to integrate this holistic observational method with "scientific analysis," this writer feels that the direction being taken is a productive one and that more effective methodologies will evolve.

It is from these assumptions that this writer formulated and executed the present study.

CHAPTER III

PROCEDURE AND ANALYSIS

Population Of The Study

The schools

School districts participating in the study were selected with a criterion of heterogeneity. An attempt was made to observe in schools which represented a wide cross section of school districts in terms of socioeconomic status, urban characteristics and size of district. Observations were arranged in the following locations:

1. A large suburban district serving over 30,000 children whose population consists primarily of white-collar and professional workers. The fine reputation of its schools was bolstered by its total operating revenue of $902 per pupil. Six pairs of children from three different schools were selected as subjects.

2. A moderately large suburban district serving 14,000 children whose population is comprised of upwardly mobile blue and white-collar workers. The school budget allots a total operating revenue of $731 per pupil. Two pairs of children in one school building were selected as subjects.

3. A small rural district serving 2,131 pupils located approximately 25 miles from the city. Its blue-collar

population lives on farms but works in nearby auto factories. Its total operating revenue per pupil is $706. Two pairs of children in one school building were observed.

The specific schools cooperating in the study within each district were selected on the basis of the interest of the building principal in the study. The building principal acted as liaison between the investigator and the teachers. He helped select those teachers in his building who would be least threatened or conscious of observers and whose classrooms would be appropriate to the study in terms of their inclusion of "disturbed" children. Because of this method of selection, there were no "turn downs." The principals were given full information about the study while the teachers were told only that the study was concerned with total classroom interactions. The children were told that observers were wanting to learn more about exactly what goes on in a classroom.

The selection procedure used has several implications for interpretation of the results of the study. Since cooperation on the part of the principal was so important and since he selected the teachers, his personal biases regarding "favorable teaching styles" must enter into the classroom interactions observed. The criteria that the teachers not be threatened by observers also may have systematically introduced a bias toward a distinctive teaching style. Such considerations must be kept in mind as the results are reviewed.

The subjects

The ten "disturbed" children who were subjects of the study ranged from seven years of age to eleven years. One of the subjects was in the second grade, two in the third grade, four in fourth grade and three in the fifth grade. While a preference for primary grades was stated, grades selected reflected the availability of "matched pairs." All subjects had been referred for special education services for the "disturbed" and were in regular classrooms but receiving some special help from an itinerant or "resource-type" special education teacher on a weekly basis. Reasons for referral were as follows:

Subject 1. Ten years of age in the fourth grade; referred for special services one year ago for "school phobia" and an obsession with death; IQ in normal range. (Female.)

Subject 2. Eleven years of age in the fifth grade; referred for special services one year ago for "acting out" aggressive behavior; IQ in low normal range. (Male.)

Subject 3. Nine years of age in the third grade; referred for special services one year ago for "acting out" and aggressive, impulsive behavior; IQ in low normal range. (Male.)

Subject 4. Ten years of age in fourth grade; referred for special services two years ago for "bizarre" behavior and poor peer relationships; IQ in normal range. (Male.)

Subject 5. Eight years of age in third grade; referred for special services one year ago for aggressive "acting out" behavior; IQ in normal range. (Male.)

Subject 6. Ten years of age in fifth grade; referred for special services five years ago for "acting out" behavior; IQ in low normal range. (Male.)

Subject 7. Nine years of age in fourth grade; referred for special services four years ago for "acting out" and "sneaky" behavior; IQ in low normal range. (Male.)

Subject 8. Nine years of age in fourth grade; referred for special services two years ago for "acting out" and temper tantrums; IQ in normal range. (Male.)

Subject 9. Seven years of age in second grade; referred for special services six months ago for "acting out" and lack of school achievement; IQ in low normal range. (Male.)

Subject 10. Eleven years of age in fifth grade; referred for special services five years ago for "acting out" and lack of school achievement; IQ in low normal range. (Male.)

All of the subjects were considered to be of normal intelligence and all achieved poorly in school. Nine of the ten were males. Again the nature of the sample was determined by availability of subjects. In the case of sex, however, tne sample accurately reflects the total population of the study since of all "disturbed" children in public schools, the great majority are males.

Subjects 11-20 were the "normal" matched mates of the "disturbed" subject 1-10. In these pairs, subjects 1 and 11, 2 and 12, etc. were matched as to sex, IQ (within 10 points), and age (within 6 months). The chief difference between the subjects in each pair was that one subject had been labeled as "disturbed" by the school while the other had not.

All "disturbed" subjects were selected by the principal of the school using the criteria of the investigator that they be of "normal" intelligence, in a regular classroom and diagnosed as needing special services due to "emotional disturbance." The "normal" subjects were selected by the principal by his matching them on the basis of room membership, age, sex and IQ. The subjects were pointed out by the principal to the investigator with no names being used and no school records being seen by the investigators to ensure confidentiality. The subjects were not identified as "normal" or "disturbed" to the observer to avoid observer bias. The teacher and the pupils in the classrooms knew only that the class activity was being observed and not that specific individuals were of prime concern.

Data Collection

Observer training

The collection of data in the form of specimen records is necessarily done by skilled observers familiar with the technique. Since no such skilled personnel were available, the task of training at least two observers was an initial concern of the study.

Personnel were recruited using the services of student placement offices in several local universities. Criteria used in the selection of the observers included maturity; experience with and concern for children, and where possible, teaching experience. The team selected was comprised of two women, both of whom had B.A.'s, one of whom had an M.S. and had taught in special education for a year.

The design and scope of the study was explained to the trainees and a copy of the procedure detailing the process of taking a specimen record presented to them (Wright, 1967). The trainees were then familiarized with the equipment to be used in the data collection: a pocket sized dictation device and a portable tape recorder. After they felt comfortable with the equipment they were encouraged to begin "taking notes" for a specimen record using the dictaphone while observing routine office activity. They then progressed to taking notes while watching video tapes of children in interview situations. At this point the trainees then used the notes for dictating the observational narrative into the portable tape recorder for the rough draft of the specimen record. These tapes were typed and read by an investigator who had not participated in that observation who assisted the trainee in the editing of the tapescript. The edited tapescripts were then compared as to the congruency of the observation. The typescripts were then evaluated using the criteria for specimen records developed by Wright (1967). After the specimen records were found to be in agreement regarding what was observed and when they fulfilled the

criteria established by Wright, the actual observations were scheduled.

The investigator and two observers met with the teachers whose classes were to be observed to explain the study and to introduce themselves. To guard against teacher bias, the teachers were told only that the study was concerned with pupil-teacher and pupil-peer interactions. If the teacher asked if specific children were to be watched she was told that the observers were to observe total class interaction. None of the teachers involved appeared anxious about the observations. They were told that they could introduce the observers to their classes if they liked and that the observers could introduce themselves and their equipment if so desired. All of the teachers, however, informed their classes of the observers ahead of time and no formal introductions were made.

The teachers were asked to select two twenty-minute periods during the day for the observations in their room. They were asked to indicate one period in which the children had a choice in their activity and one period in which the children had no choice but were told what to do. The order of the observations was not a variable in the study. These periods were then scheduled for observation and the observers reported to the rooms one-half hour prior to each activity period to provide the class a "period of adjustment" to the observer. In all instances, the "non-choice" or structured setting was an arithmetic or reading lesson. The "choice setting" observed was usually a "free" period in which

children could do seat work, play games or talk quietly, though one unstructured art lesson was observed and one period in a "resource materials center."

The observers took verbal notes with dictaphone during the scheduled period, delineating one-minute intervals as time references. Afterward these notes were utilized in dictating a narrative account of the observation into a portable tape-recorder. Typescripts were then made, edited and final copies used for the process of delineating Environmental Force Units. Approximately 600 pages of typescript were produced. (See Appendix A for sample specimen record typescript.)

Environmental Force Unit Coding And Categorization of the Data

The investigator had been taught the skills involved in delineating Environmental Force Units using the definitions, study materials, and "rules of thumb" of Schoggen. Sample specimen records which had been EFU'd by Schoggen were obtained and used in training.

Four individuals were trained to identify Environmental Force Units (EFU's) in the specimen records of behavior compiled by the observers. The purpose of the study was explained and didactic material concerning the identification of EFU's presented (Schoggen, 1963). The coders practiced the identification of EFU's on plain specimen records which were then checked against the EFU's found in that specific record by Mrs. Schoggen. After some proficiency was developed the coders would EFU a sample record and then compare them among themselves. When the reliability quotient reached 80% agreement on the location

and label of EFU's, the coders began work on the data of the study. Two coders divided each specimen record into EFU's independently. The EFU'd records would then be compared and any disagreements worked out by the coders. Only 12% of the EFU's revealed such disagreements. The end product was then a specimen record in which Environmental Force Units had been identified by two independent coders.

The coders then, working independently, categorized and tallied the frequencies of Environmental Force Units according to the six variables represented in the study hypotheses:[1]

1. The frequency of total EFU's per observation.
2. The frequency of EFU's per observation initiated by the subject as opposed to those initiated by the agent.
3. The frequency of EFU's per observation in which the subject was the sole target of the EFU as opposed to those in which a group target existed.
4. The frequency of EFU's per observation in which conflict was evident between the goals of agent and subject as opposed to those in which no conflict was evident.
5. The frequency of EFU's per observation in which methods adjudged to be coercive were employed by the agent as opposed to those in which non-

---

[1]Frequency counts were adjusted to compensate for length of observation by using the formula:

$$\text{Adjusted } N = \frac{\text{Duration of shortest Period}}{\text{Duration of Record X}} \times \text{Actual number of EFU in Record X}$$

coercive methods were employed.

6. The frequency of EFU's per observation in which the agent was an adult as opposed to a peer of the subject.

These data are summarized by Tables 1 through 6.

TABLE 1

TOTAL ADJUSTED NUMBER OF EFU'S (VARIABLE 1)

Subject	Choice Setting	Non-choice Setting
	Disturbed	
1	6.67	5.83
2	15.65	7.00
3	13.57	14.78
4	1.90	10.91
5	12.00	28.18
6	26.00	4.17
7	9.00	6.00
8	13.55	7.62
9	17.14	7.83
10	4.35	3.81
	Non-disturbed	
11	8.00	10.91
12	15.86	15.20
13	11.54	9.33
14	25.71	4.57
15	20.00	22.86
16	6.40	8.00
17	16.92	8.80
18	15.24	14.29
19	17.27	11.82
20	9.57	10.91

TABLE 2

ADJUSTED NUMBER OF EFU INITIATED BY SUBJECT
(VARIABLE 2)

Subject	Choice Setting	Non-choice Setting
	Disturbed	
1	2.67	3.33
2	5.22	0.00
3	3.57	3.48
4	0.95	6.36
5	5.00	11.82
6	12.00	2.50
7	2.00	0.00
8	5.81	0.95
9	8.57	0.00
10	0.00	0.00
	Non-disturbed	
11	5.33	2.73
12	6.21	1.60
13	1.54	2.67
14	11.43	2.86
15	6.67	5.71
16	0.00	1.00
17	5.38	3.20
18	4.76	0.95
19	5.45	5.45
20	1.74	0.91

TABLE 3

ADJUSTED NUMBER OF EFU IN WHICH SUBJECT IS SOLE TARGET (VARIABLE 3)

Subject	Choice Setting	Non-choice Setting
	Disturbed	
1	3.33	5.83
2	13.91	1.00
3	12.14	9.57
4	0.95	8.18
5	9.00	20.00
6	13.00	4.17
7	5.00	0.00
8	10.32	1.90
9	16.19	1.74
10	1.74	0.00
	Non-disturbed	
11	8.00	9.09
12	13.10	4.00
13	6.92	6.00
14	21.90	4.00
15	20.00	15.24
16	4.80	8.00
17	12.31	4.00
18	10.48	3.81
19	12.73	8.18
20	3.48	1.82

TABLE 4

ADJUSTED NUMBER OF EFU IN WHICH CONFLICT OCCURRED (VARIABLE 4)

Subject	Choice of Setting	Non-choice setting
	Disturbed	
1	0.0	0.0
2	6.96	1.00
3	7.14	7.83
4	0.0	2.73
5	3.00	9.09
6	5.00	0.0
7	4.00	0.0
8	4.52	0.95
9	4.76	0.0
10	0.0	0.0
	Non-disturbed	
11	1.33	0.91
12	3.45	0.0
13	3.08	4.00
14	4.76	0.57
15	4.17	4.76
16	0.80	2.00
17	3.08	1.60
18	4.76	0.95
19	3.64	0.91
20	0.87	0.0

TABLE 5

ADJUSTED NUMBER OF EFU IN WHICH A COERCIVE METHOD WAS USED BY AGENT (VARIABLE 5)

Subject	Choice Setting	Non-choice Setting
	Disturbed	
1	0.00	0.00
2	1.74	0.00
3	3.57	3.48
4	0.00	0.00
5	1.00	1.82
6	2.00	0.00
7	1.00	0.00
8	0.65	0.00
9	0.95	0.00
10	0.00	0.00
	Non-disturbed	
11	0.00	0.00
12	2.76	0.00
13	0.77	2.00
14	3.81	0.57
15	0.83	2.86
16	0.00	0.00
17	0.77	0.00
18	0.00	0.00
19	0.00	0.00
20	0.00	0.00

TABLE 6

ADJUSTED NUMBER OF EFU CONTAINING ADULT AGENT
(VARIABLE 6)

Subject	Choice Setting	Non-choice Setting
	Disturbed	
1	0.00	2.50
2	6.09	7.00
3	11.43	7.83
4	1.90	6.36
5	4.00	15.45
6	12.00	2.50
7	4.00	6.00
8	4.52	6.67
9	3.81	7.83
10	4.35	3.81
	Non-disturbed	
11	0.00	2.73
12	6.90	14.40
13	6.15	4.67
14	10.48	1.71
15	4.17	11.43
16	1.60	3.00
17	6.92	6.40
18	10.48	12.38
19	2.73	8.18
20	7.83	10.00

Statistical Analysis

Hypotheses tested

The hypotheses found in Chapter I may be summarized for statistical purposes in null forms as follows:

> For each Variable X, "disturbed" children will not have significantly different numbers of EFU's than their "non-disturbed" matchmates (Factor A).
>
> For each Variable X, there will be no significant difference in the numbers of EFU's recorded in choice as opposed to non-choice settings (Factor B).
>
> For each Variable X, the interaction of sample (Factor A) and setting (Factor B) will produce no significantly different numbers of EFU's.

Analysis of Variance

The following three-factor analysis of variance model, an A x B x S design, was used where Factor A ("Disturbed" - "Non-disturbed"), Factor B ("Choice setting" - "Non-choice setting"), and Factor S (Matched Pair) were each crossed with the other two factors (Lindquist, 1953). Factors A and B were said to be "fixed effects" while Factor S was "random." Because of this interaction of fixed and random effects, it was statistically possible to test F ratios only for Factors

A and B and their interaction. Factor S was used to eliminate variance due to differences between classrooms and schools.

S (Pair)	A_1("Disturbed")		A_2("Non-disturbed")	
	B_1(choice)	B_2(non-choice)	B_1(choice)	B_2(non-choice)
1	Subject	1	Subject	11
2	Subject	2	Subject	12
3	Subject	3	Subject	13
4	Subject	4	Subject	14
5	Subject	5	Subject	15
6	Subject	6	Subject	16
7	Subject	7	Subject	17
8	Subject	8	Subject	18
9	Subject	9	Subject	19
10	Subject	10	Subject	20

Fig. 1.--Analysis of variance design.

This analysis of variance compared the mean scores of the two samples of subject (Factor A) in the two settings (Factor B) to determine if significantly higher means exist for either sample within either setting. The interaction of Factors A and B was computed to determine if there exists a significant interactional effect between sample and setting. Factor S is used to eliminate variance due to inter-classroom differences.

In using this analysis of variance model one assumes that the relatedness of the data derived from each of the two subjects in a matched pair is comparable to the relatedness

of data derived from observing the same subject in two separate observations. Given the impossibility of manipulating many variables in psychological research (one may not expose a single subject to the conditions of disturbance and non-disturbance) this assumption regarding matching is a common one.

CHAPTER IV

RESULTS OF THE STUDY

The analysis of variance model used compared the samples of "disturbed" and "non-disturbed" children across choice and non-choice settings to determine if significant differences occurred in the frequency counts of each of the six variables. These differences could be determined to be between the two samples of children, between the two types of settings or to be a result of the interaction of sample and setting. The results of this analysis were used to test the six hypotheses of the study. The F-ratios were obtained as follows:

$$\text{For Factor A, } F = \frac{\text{Mean Square A}}{\text{Mean Square AS}}$$

$$\text{For Factor B, } F = \frac{\text{Mean Square B}}{\text{Mean Square BS}}$$

$$\text{For Factor C, } F = \frac{\text{Mean Square AB}}{\text{Mean Square ABS}}$$

F-ratios for Factor S were statistically impossible to obtain since S was a random effects factor. Factor S in this design was used to eliminate variance occurring between classrooms and schools.

The hypotheses of the study are presented here in null form and presented in their component parts for purposes of clarity.

Hypothesis 1

A. "Disturbed" children will not have significantly different numbers of EFU's per setting than their "non-disturbed" matchmates. (Factor A.)

B. There will be no significant difference in the numbers of EFU's recorded in choice as opposed to non-choice settings. (Factor B.)

C. The interaction of Factors A and B will produce no significant difference in the numbers of EFU's.

The cell means for Factors A and B are found in Table 7.

TABLE 7

VARIABLE 1 CELL MEANS FOR TOTAL ADJUSTED EFU'S

	A_1	A_2
B_1	11.98	14.65
B_2	9.61	11.66

The analysis of variance results are seen in Table 8.

TABLE 8

ANALYSIS OF VARIANCE FOR VARIABLE 1, TOTAL ADJUSTED NUMBER OF EFU'S

Source	Sum of the Squares	Degrees of Freedom	Mean Square	F-Ratio	Significance Level
Factor A (Disturbed-non-disturbed)	55.7904	1	55.7904	2.3374	0.16
Factor B (Choice-non-choice)	71.6097	1	71.6097	2.3143	0.16
Factor S (Pair)	511.1865	9	56.7985	---	---
AS	214.8114	9	23.8679	---	---
AB	0.9363	1	0.9363	0.0188	---
BS	278.4799	9	30.9422	---	---
ABS	447.6780	9	49.7420	---	---

Inspection of the means reveals that the "disturbed" sample (A_1) were recorded with fewer EFU's than the "non-disturbed" (A_2) and the choice situation (B_1) resulted in more EFU's than the non-choice (B_2) The F-ratio for the disturbed-non-disturbed factor was found to reach the .16 level of significance. The F-ratio for interaction of choice-non-choice factor was also found at the .16 level of significance. The F-ratio for interaction of these two factors was not found to reach significance.

Statistically, all components of the null hypothesis would be supported--there are no differences in the numbers of EFU's when compared across sample or setting, nor is there an interaction effect. The absolute differences noted, however, should be kept in mind as further results are revealed.

Hypothesis 2

A. "Disturbed" children will not have significantly different numbers of subject-initiated EFU's per setting than their "non-disturbed" matchmates. (Factor A.)

B. There will be no significant difference in the numbers of subject-initiated EFU's recorded in choice as opposed to non-choice settings. (Factor B.)

C. The interaction of Factors A and B will produce no significant difference in the numbers of

subject-initiated EFU's per setting.

The cell means for Factors A and B are found in Table 9.

TABLE 9

VARIABLE 2 CELL MEANS FOR SUBJECT-INITIATED EFU'S

	A_1	A_2
B_1	4.57	4.85
B_2	2.84	2.70

The results of the analysis of variance are found in Table 10.

Inspection of the means reveals that the "disturbed" sample (A_1) was recorded as having very similar frequencies of subject-initiated EFU's as the "non-disturbed" sample (A_2), but the choice situations (B_1) resulted in more subject-initiated EFU's than the non-choice situation (B_2). The F-ratio for the disturbed-non-disturbed factor was not found to reach significance. The F-ratio for the choice-non-choice factor was found to be at the .04 level of significance, one of the most significant differences found by the study. The F-ratio for the interaction of these two factors was not found to reach significance.

Statistically, the component of the null hypothesis regarding differences between the two types of children would be supported, but the hypothesis that there are no differences between the two types of situations would be rejected. The null hypothesis regarding an interaction effect would also be

TABLE 10

ANALYSIS OF VARIANCE FOR VARIABLE 2, ADJUSTED NUMBER OF EFU'S WHICH WERE INITIATED BY THE SUBJECT

Source	Sum of the Squares	Degrees of Freedom	Mean Square	F-Ratio	Significance Level
Factor A (Disturbed-non-disturbed)	0.0462	1	0.0462	0.005	---
Factor B (Choice-non-choice)	37.5972	1	37.5972	5.7735	0.04
Factor S (Pair)	115.6598	9	12.8510	---	---
AS	81.5916	9	9.0657	---	---
AB	0.4161	1	0.4161	0.0331	---
BS	58.6088	9	6.5120	---	---
ABS	113.0777	9	12.5641	---	---

supported. One may conclude that choice situations result in higher frequencies of subject-initiated EFU's than non-choice situations for the two types of children.

Hypothesis 3

A. "Disturbed" children will not have significantly different numbers of EFU's per setting in which the subject is the sole target than their "non-disturbed" matchmates. (Factor A.)

B. There will be no significant difference in the numbers of EFU's in which the subject is the sole target recorded in choice as opposed to non-choice settings. (Factor B.)

C. The interaction of Factors A and B will produce no significant difference in the numbers of EFU's in which the subject is the sole target.

The cell means for Factors A and B are found in Table 11.

TABLE 11

VARIABLE 3 CELL MEANS FOR EFU'S IN WHICH THE SUBJECT WAS SOLE TARGET

	A_1	A_2
B_1	8.55	11.37
B_2	5.23	6.41

The results of the analysis of variance are found in Table 12.

TABLE 12

ANALYSIS OF VARIANCE FOR VARIABLE 3, ADJUSTED NUMBER OF EFU'S IN WHICH SUBJECT WAS SOLE TARGET

Source	Sum of the Squares	Degrees of Freedom	Mean Square	F-Ratio	Significance Level
Factor A (Disturbed-non-disturbed)	39.7803	1	39.7803	2.9907	0.12
Factor B (Choice-non-choice)	171.2718	1	171.2718	7.8412	0.02
Factor S (Pair)	476.2908	9	52.9212	---	---
AS	119.7115	9	13.3012	---	---
AB	6.7158	1	6.7158	0.2141	---
BS	196.5821	9	21.8424	---	---
ABS	282.2534	9	31.3614	---	---

Inspection of the means reveals that the "disturbed" sample (A_1) was recorded as having fewer sole target EFU's per setting than the "non-disturbed" sample (A_2). The choice setting (B_1) resulted in higher frequencies of sole target EFU's than the non-choice setting (B_2). The F-ratio for the disturbed-non-disturbed factor was found at the .12 level of significance. The F-ratio for the choice-non-choice factor was determined significant at the .02 level--the highest level of significance found by the study. The F-ratio for the AB interaction was not significant.

Statistically, the null hypothesis regarding differences between the two types of children would be supported, but the hypothesis that there are no differences between the two types of settings would be rejected. The null hypothesis regarding the interaction effect would also be supported. One may conclude that though no differences exist between the matchmates regarding the number of sole target EFU's per setting, choice settings do produce for both groups a higher frequency of such EFU's than non-choice settings.

Hypothesis 4

A. "Disturbed" children will not have significantly different numbers of EFU's per setting in which conflict occurred between the goals of the subject and environmental agent than will their "non-disturbed" matchmates. (Factor A.)

B. There will be no significant difference in the number of EFU's in which conflict occurred

recorded in choice as opposed to non-choice settings. (Factor B.)

C. The interaction of Factors A and B will produce no significant difference in the numbers of EFU's in which conflict occurred.

The cell means for Factors A and B are found in Table 13.

TABLE 13

VARIABLE 4 CELL MEANS FOR EFU'S IN WHICH CONFLICT OCCURRED

	A_2	A_2
B_1	3.53	2.99
B_2	2.16	1.57

The result of the analysis of variance are found in Table 14.

Inspection of the means reveals that the "disturbed" sample (A_1) was recorded in both settings as having greater numbers of EFU's in which conflict occurred than did the "non-disturbed" sample (A_2). The choice setting (B_1) for both samples resulted in higher frequencies of EFU's containing conflict than did the non-choice setting (B_2). The F-ratio for the disturbed-non-disturbed factor was found at the .30 level of significance. The F-ratio for the choice-non-choice factor was determined to be at the .10 level of significance. The F-ratio for the AB interaction was also found not to reach significance.

TABLE 14

ANALYSIS OF VARIANCE FOR VARIABLE 4, ADJUSTED NUMBER OF EFU'S IN WHICH CONFLICT OCCURRED

Source	Sum of the Squares	Degrees of Freedom	Mean Square	F-Ratio	Significance Level
Factor A (Disturbed-non-disturbed)	3.2148	1	3.2148	1.1851	0.30
Factor B (Choice-non-choice)	19.6280	1	19.6280	3.2812	0.10
Factor S (Pair)	105.9333	9	11.7703	---	---
AS	24.4142	9	2.7126	---	---
AB	0.0052	1	0.0052	0.0013	---
BS	53.8375	9	5.9819	---	---
ABS	33.5926	9	3.7325	---	---

Statistically, the null hypothesis regarding differences in frequencies of EFU's containing conflict would be supported for both sample and setting. The null hypothesis regarding interaction effect would also be supported. One concludes that differences occurring between samples and settings are likely to have been due to chance, but the proximity to significance for Factor B is a continuation of a trend throughout all hypotheses.

Hypothesis 5

A. "Disturbed" children will not have significantly different numbers of EFU's per setting in which coercion by the agent is evident than their "non-disturbed" matchmates. (Factor A.)

B. There will be no significant difference in the number of EFU's in which coercion by the agent is evident in choice as opposed to non-choice settings. (Factor B.)

C. The interaction of Factors A and B will produce no significant difference in the numbers of EFU's in which coercion by the agent is evident.

The cell means for Factors A and B are found in Table 15. The results of the analysis of variance are found in Table 16.

Inspection of the means reveals little difference between the frequencies recorded for the "disturbed" sample (A_1) and the "non-disturbed" sample (A_2) The choice setting (B_1) for both samples resulted in higher frequencies of EFU's

containing coercion by the agent than did the non-choice setting (B_2). Neither the F-ratio for the disturbed-non-disturbed factor nor the F-ratio for the AB interaction was found to reach significance. The F-ratio for the choice-non-choice factor reached the .20 level of significance.

TABLE 15

VARIABLE 5 CELL MEANS FOR EFU'S IN WHICH COERCION BY THE AGENT IS EVIDENT

	A_2	A_2
B_2	1.09	0.89
B_2	0.53	0.54

Statistically, the null hypothesis for all three components was supported.

Hypothesis 6

A. "Disturbed" children will not have significantly different numbers of EFU's per setting in which the agent is an adult than their "non-disturbed" matchmates. (Factor A.)

B. There will be no significant difference in the number of EFU's containing an adult agent in choice as opposed to non-choice setting. (Factor B.)

C. The interaction of Factors A and B will produce no significant difference in the numbers of EFU's containing adult agents.

The cell means for Factors A and B are found in Table 17.

TABLE 16

ANALYSIS OF VARIANCE FOR VARIABLE 5, ADJUSTED NUMBER OF EFU'S CONTAINING COERCION

Source	Sum of the Squares	Degrees of Freedom	Mean Square	F-Ratio	Significance Level
Factor A (Disturbed-non-disturbed)	0.0846	1	0.0846	0.0686	---
Factor B (Choice-non-choice)	2.0793	1	2.0793	1.8570	0.20
Factor S (Pair)	23.2977	9	2.5886	---	---
AS	11.0848	9	1.2316	---	---
AB	0.1102	1	0.1102	0.2015	---
BS	10.0775	9	1.1197	---	---
ABS	4.9203	9	0.5467	---	---

TABLE 17

VARIABLE 6 CELL MEANS FOR EFU'S CONTAINING ADULT AGENTS

	A_1	A_2
B_1	5.21	5.72
B_2	6.59	7.49

The results of the analysis of variance are found in Table 18.

Inspection of the means reveals that the "disturbed" sample (A_1) were recorded in both settings as having slightly fewer numbers of EFU's containing an adult agent than the "non-disturbed" sample (A_2). The choice setting (B_1) for both samples contained fewer EFU's with adult agents than did the non-choice setting (B_2). Neither the F-ratio for the disturbed-non-disturbed factor nor the F-ratio for the AB interaction was found to reach significance. The F-ratio for the choice-non-choice factor was found to be at the .24 level of significance.

Statistically, the null hypothesis would be supported for all three components.

Summary

A total of 18 tests of significance were administered. The frequency scores for each of the six variables were analyzed for differences between types of children, between settings and for the interaction effect of type of child and

TABLE 18

ANALYSIS OF VARIANCE FOR VARIABLE 6, ADJUSTED NUMBER OF EFU'S WITH ADULT AGENT

Source	Sum of the Squares	Degrees of Freedom	Mean Square	F-Ratio	Significance Level
Factor A (Disturbed-non-disturbed)	4.9773	1	4.9773	0.3669	---
Factor B (Choice-non-choice)	24.7905	1	24.7905	1.5659	0.24
Factor S (Pair)	188.2623	9	20.9180	---	---
AS	122.0779	9	13.5642	---	---
AB	0.3591	1	0.3591	0.0345	---
BS	142.4765	9	15.8307	---	---
ABS	93.4349	9	10.3816	---	---

setting. Of these 18 tests, only two were found to be significant, and both of these were concerned with differences between settings. The fact that such a small number of significant results were found in proportion to to the number of tests administered, greatly increases the probability that such results may be due to chance.

Differences found in the six EFU variables between the "disturbed" and "non-disturbed" samples did not reach statistical significance at an .05 level of confidence. In the case of three of the variables, (total EFU, Sole Target EFU, and Conflict EFU) the chance that these differences between the two samples was due to random factors was 30% or less. Such differences, while not remotely approaching statistical significance, may suggest that there is a very slight tendency for "disturbed" children:

a) to experience fewer total EFU's per setting than "non-disturbed" children,

b) to experience fewer EFU's in which they are the sole target of the environmental agent, and

c) to experience more EFU's in which there is conflict between the goal of the agent and that of the child.

This latter trend may be more significant than it appears since it is, by necessity, related to the first variable, total number of EFU's, but indicates results in the opposite direction. Even though "disturbed" children generally had fewer EFU's, they tended to have more EFU's containing conflict.

Differences found in the EFU variable between choice and non-choice settings were found to be significant in two of the six variables. The differences revealed in the other four variables, though far from statistically significant, were consistently in the same direction. These data reveal the choice situations when compared with non-choice settings for the two samples tended to result in:

a) greater numbers of Environmental Force Units which were initiated by the subject, and

b) greater numbers of Environmental Force Units in which the subject was the sole target of an environmental agent.

Furthermore, while not statistically significant, choice situations tended to result in:

a) greater numbers of EFU's,

b) greater numbers of EFU's in which a conflict existed between the goal of the subject and that of the agent,

c) greater numbers of EFU's in which a coercive method was used by an agent, and

d) fewer numbers of EFU's in which the environmental agent was an adult.

There seems to be a consistency in the trend toward greater numbers of EFU's across all variables in choice situations. That these were with peers also is of interest.

CHAPTER V

CONCLUSIONS

Examination Of The Results

Applying the commonly used levels of confidence, .01 or .05, the statistically substantiated results of the study are limited to the difference found for two variables between choice and non-choice situations. (These are but two findings of significance out of a total of 18 tests of significance.) The frequencies of Environmental Force Units initiated by the subject and the frequencies of Environmental Force Units in which the subject was the sole target appear significantly higher in choice settings. These results are not unexpected given the nature of a choice situation. One would expect children to be able, if not encouraged, to initiate more conversations or other forms of interaction in a setting in which they have the freedom to choose from a variety of activities. The increased number of EFU's in which they were the sole target would seem also to reflect this increased individual interaction as children engaged in individual conversations. These results would also seem to give validity to the teacher's designation of these periods as truly less structured and as presenting "choice" to the child.

The other trends, albeit based on consistently non-

significant findings, identified in the data results regarding choice and non-choice situations support these two significant findings. The tendency for choice situations to contain greater total EFU's and more EFU's in which the agent was a peer again coincides with what one would expect in a less structured classroom situation. At first glance, the tendency for greater numbers of conflict or coercive EFU's to occur in choice situations may seem contradictory to "choice." Inspection of the specimen records themselves, however, reveals that many of these frequencies were recorded when the environmental agent was a peer having some mild disagreement with the subject.

The fact that neither difference nor a consistent trend toward difference in numbers of Environmental Force Units was found between the "disturbed" and "non-disturbed" samples must be the most significant result of the study. The results of this study dictate the conclusion that the environments of "disturbed" and "non-disturbed" children in the same setting as measured by EFU's are essentially the same. These results are in agreement with the results obtained by Schoggen (1968) using much the same methodology. The Schoggen study, using Environmental Force Units as the measurement instrument, revealed no differences in the quantity or types of interactions experienced by orthopedically handicapped youngsters and a matched control group.

The agreement of the results of these two studies, both of which observed handicapped children and a matched control group, leads to a conclusion that, despite preconceptions

regarding the reaction of the environment to handicapped youngsters, no environmental differences did, in fact, exist. The handicapped child recorded as many verbal interactions as the normal youngster in the setting and the type of interactions as measured by this study were no different than those of his peers.

Since "emotionally disturbed" children are identified by the school in terms of their overt behavior and the "problems" they cause in their classroom interactions, the finding of no difference in environmental interaction is rather startling. One may conclude that the label "emotionally disturbed" as applied by the school is based upon criteria unrelated to environmental interaction assessed, that the phenomenon of emotional disturbance is independent of environmental interaction, or that the instrument used by this study was not effective in measuring the environmental phenomena. Any of these conclusions may be valid. Many writers (Fried, 1964; Kounin, Friesin & Norton, 1966; Mercer, 1965) have postulated that such labels as "emotional disturbance" and "mental retardation" are used as social system devices for reducing problems caused by behavior in some way deviant from the behavior of the majority. The behavior exhibited by tnose so singled out need not correspond to the label applied. The deviance instigating the labeling procedure may be the result of cultural background, physical appearance or socio-economic phenomena. Though the school is a prime offender in the expeditious categorization of children for purposes of maintaining uniformity with the classroom, in this study

one of the other two alternatives appears more plausible to this author.

The assumption that emotional disturbance is unrelated to environmental interaction would also be extremely difficult to substantiate. Even if one were to assume a psychodynamic viewpoint concerning the etiology and nature of the "disturbance," the manifestation of this intrapsychic phenomenon is usually seen in overt interpersonal behavior and in the quality and quantity of verbal interactions. For example, one of the chief behavioral characteristics of such conditions as autism is a lack of verbal communication. The existence of "emotional disturbance" without its manifestation in environmental interactions seems untenable.

This author is led to the third alternative as a result of his own theoretical bias and because of some less formal data obtained from the study in the form of observer reactions. Theoretically, emotional disturbance viewed from an ecological perspective must be evident in the interchange between individual and setting. Disturbance from this viewpoint is seen as an incongruence between individual and setting or milieu. This incongruence must be made manifest in an observable manner or the child would not be labeled as deviant. Intuitively, the transcripts from which the data were gathered reveal distinctive differences in the two samples. Although the observers were never told which subject was "disturbed" and which was not "disturbed" and though they had no background in psychology, they could identify the "disturbed" child without exception after each observation.

(This fact also has implications regarding possible contamination of the study results.) The reasons given for this identification were always couched in terms of that child's interaction with the other in the room. Often that child was said to be a barometer of the class climate. In several instances in which acting out or anxious behavior were rampant throughout the room, it was the child labeled "disturbed" who seemed most sensitive to and reflective of this atmosphere.

The identification of the reasons why these interactional differences were not detected may be a valuable contribution of the study. This investigator offers two primary causes for consideration:

1. a "hidden" sub-sample of children;
2. gaps in the developing methodology of "ecological psychology."

The Sample Of "Disturbed" Children

For purposes of this study the sample of "disturbed" children were those children who had been diagnosed and labeled as "disturbed" by the school and its special education component. It was the intent of this study to deal with the population of children classified as disturbed in schools whether or not these children may be seen as "disturbed" by other types of institutions.

Inspection of the data for the sample of "disturbed" children did, however, reveal the possibility that there were in reality two populations of children represented in the

sample. Because of the nature of the interactions of two populations, the data within the "disturbed" sample tended to "cancel itself out" by increasing the variance between pairs. Figures 2 and 3 demonstrate the bi-modal nature of the distribution of adjusted total EFU's for the "disturbed" sample as contrasted with the normal curve of the "non-disturbed" sample.

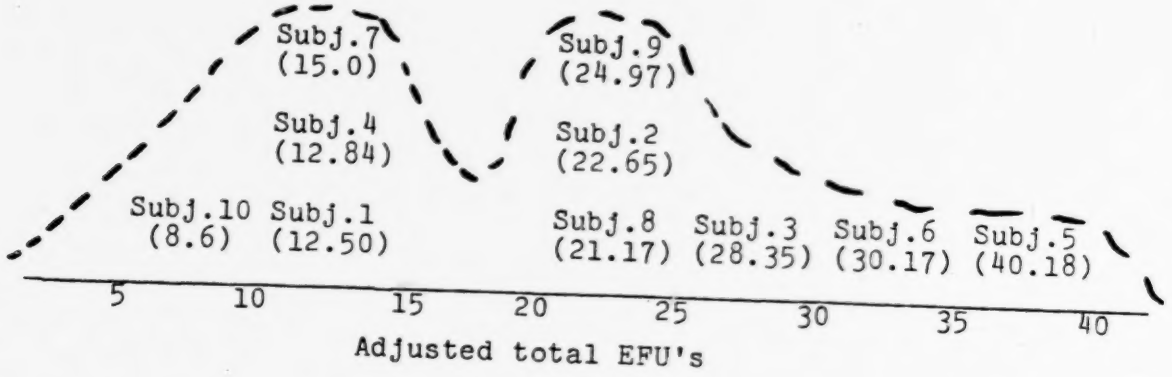

Fig. 2.--Distribution of adjusted total EFU's for "disturbed" sample.

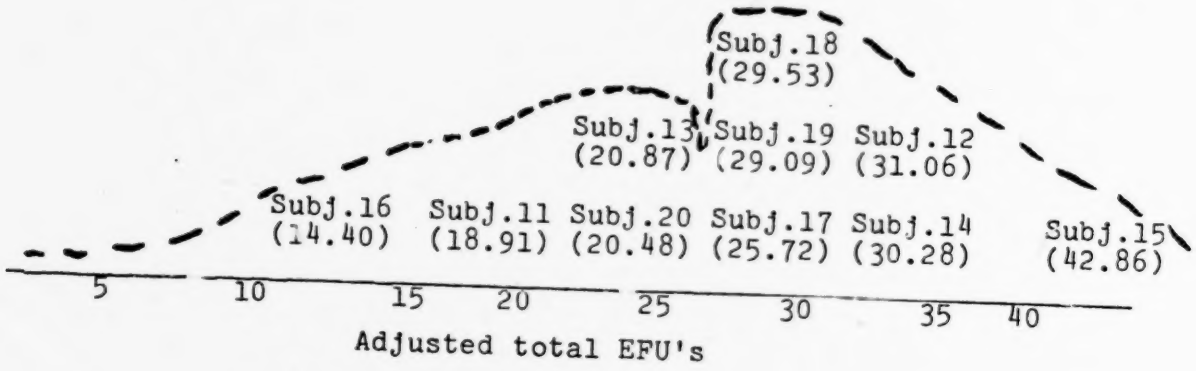

Fig. 3.--Distribution of adjusted total EFU's for "normal" sample.

Four of the subjects within the "disturbed" sample were recorded with fewer than 15 EFU's per setting. There was a range of approximately 7 in this group of four. The remaining six were recorded as having at least 21 EFU's per setting with a range of 19. The "non-disturbed" sample of children recorded total EFU scores which somewhat more closely resemble a normal curve centering about a mean of 26.30 EFU's per setting. All but one of the "non-disturbed" sample recorded at least 15 EFU's per setting.

These data would indicate that two groups of children were represented by the "disturbed" sample--children who seem isolated or withdrawn and have few EFU's as a result, and those whose social contacts as measured by EFU's correspond more closely to the "non-disturbed" distribution. The latter group also contains several individuals whose EFU frequencies are exceedingly large. By including in the overall "disturbed" group these two groups, whose frequencies on the very basic measure of total EFU are dissimilar, one would appear to confound the results. The high and low frequencies found within the sample would tend to reduce the potency of differences between that sample and the "non-disturbed" sample. The exceedingly high frequencies of EFU's found for several of the "disturbed" sample were "washed out" in the results as they were combined with the unusually low frequencies of several subjects in the "disturbed" sample for the mean value.

It is interesting to note that the "clinical descriptions" given by the school for each member of the "disturbed" sample include "withdrawal" as part of the description in only one

case. All of the others are described as "acting out" or "aggressive." Either the school records deal with behavior description in terms too broad to be accurate or members of the "disturbed" sample were intimidated by the observation and tended to behave in an inhibited manner. Either or both of these explanations may be valid.

On the basis of this "split" within the "disturbed" sample, one may conclude that children labeled as "disturbed" may be classified into two distinct groups--those who have characteristics associated with social isolation or withdrawal and those whose frequency of interactions with adults and peers more closely corresponds to "normal" frequencies. Included in the latter group may be the "acting out" or "aggressive child" described by school records. This hunch gained by inspection of the data is corroborated by the research efforts of others in the field of emotional disturbance in children to "sort out" the types of children now lumped under the rubric of "disturbed." Such work is being currently pursued by Rue Cromwell at Wayne State University and promises to be a valuable addition to the literature of disturbance. It again points out the inadequacy of using stereotypic categories for dealing with children. The category of "disturbance" would appear to house children exhibiting quite different behavioral repetoires and having quite different needs. The children exhibiting acting out or aggressive behavior tend to have many social contacts in school with peers and with the teacher, though many of these are of a conflictual nature. Other "disturbed" children,

however, interact very little with peers and their school interactions seem limited to infrequent directions given by the teacher. With two such distinct behavior patterns, it seems very inappropriate for either research or intervention efforts to use the term "disturbed" as a grouping criteria or description of children.

Methodology

A second reason for the inability of this study to discern statistical differences in the interactive environments of "disturbed" and "non-disturbed" children may lie in several of the data gathering and analytical methods of "ecological" psychology. Because of the emphasis in this area of psychology upon data gathering within the natural setting, many problems arise in regard to sampling and data collection.

Gaining access to a public school classroom for purposes of research is rapidly becoming an impossibility. The reasons for this are varied and both practical and bureaucratic in nature. When one finally does manage to acquire access a great many "degrees of freedom" are lost. The composition of the sample of classrooms or teachers tends to be influenced most by accessibility rather than by the variables to be studied. In the case of this study, the volunteering and cooperation of the building principal was a pre-condition to selection of the sample of classrooms. The principal became the key figure in both the selection of the classrooms and of the individual subjects. His choosing of the subjects was necessary because the school records were

inaccessible to the investigator. Such influence from a variable unaccounted for by the study (the principal) can certainly lead one to qualify the results. The fact does remain, however, that the children labeled "disturbed" had been so diagnosed through official school channels and thereby reflect the concept of "disturbance" utilized by the entire school system rather than the principal.

This problem of accessibility to subjects and the necessity of compromise in experimental design, is certainly not new to psychology. The difficulties in arranging observations in natural settings are a result not only of logistical problems but are a result of a growing resistance of many institutions, particularly schools, to being "exploited" as research sites. In the six months it took this investigator to get permission to observe in the schools included in this study, a general mistrust concerning the university was repeatedly voiced by teachers, principals and administrators. The general feeling of school personnel was that university researchers "exploited" schools by setting up the experiment, gaining a degree and leaving the school without feedback concerning the results. Ecological psychology must develop methods of feedback regarding information gained or its accessibility to sites will be severly hampered. The results of this study will be presented to the staff of each participating school in an in-service training session.

The role of the principal in the study, though more active than one might wish in controlling all variables, was a necessary compromise. It was through this use of the

principal that the school's concerns regarding confidentiality of school records were assuaged. The school records were never seen by these investigators since the principal provided all necessary information for the study.

In leaving a laboratory setting and attempting to observe in a natural setting, ecological psychology makes an implicit value judgment. The ecological psychologist must decide that despite the "hassle" and methodological compromise inherent in using "natural settings," the results are still more desirable than are those gained from study in a more controlled but artificial setting. Though this results in much more complexity in design and interpretation and greatly increases the "contamination" of the results by extraneous variables, the results do reflect real life behavior with its natural motivations, conditionings and influences. Though the chances of ferreting out pure causal relationships is much reduced, one does obtain a much more valid and useful description of human behavior as it naturally occurs. A case could also be made for the position that the experimental laboratory is, in fact, introducing confounding variables in its artifical environment. This must be more valuable to the ecological psychologist as he seeks to apply this knowledge in "real life situations" than the applicability which is extremely confined by the laboratory. If this value judgment were more explicit in the experimental studies of ecological psychologists, perhaps the field would be less "paranoid" concerning the validity of its results.

Ethical dilemmas also arise once access is made into a natural setting. In order to observe in a "natural setting," one must either do the observation undetected and without informing the subjects (a procedure rapidly becoming ethically and legally disreputable) or the time frame of the observation must be long enough for the initial effects of observer intrusion to "wear off" and for the observer to become "absorbed" into the setting. Even if the latter methodology is adopted, one faces the problem of explaining the purposes of the observation to those observed. If individuals are to be observed, how much is told to them without "contaminating the results"? An attempt was made by this study to compromise in the solution of these problems. Subjects were told the general nature of the observation but not that individuals were to be observed. It was logistically impossible to establish a time frame for the study to completely eliminate "observer effects," though some time was alloted to this purpose. The issue raised, however, has yet to be fully confronted by psychological research. The increasing ethical and legal parameters being applied to research in regard to individual rights to privacy and informed consent must be accounted for in research efforts. The extent to which "knowledgeable subjects" will influence the results has yet to be determined. One possible method of circumventing such effects may lie in long term experiments in which the observer eventually becomes "imbedded" in the setting. Such an alternative again points to the desirability of a "field station" approach in which many studies operate

from a central location over a long term period. The "field station" becomes a rather permanent part of the community.

The problem of observer bias is also an omnipresent one. In fact, in a specimen record the observer is encouraged to make some types of subjective judgments. The question of the objective validity of data derived from these specimen records was found by this investigator to be one never fully answered. The judgment concerning the validity of the specimen records in the end rested upon the intuition of the investigator. These biases must be weighed in considering results. Such subjective elements, however, do not invalidate the results.

The sheer effort and great amounts of time and resources demanded by the specimen record methodology may also influence observers in subtle ways. How much data is lost through sheer observer fatigue or frustration is a matter of speculation. The difficulties encountered in making an intensive 30 minute observation, followed by a written description and then later the editing of these results are not to be underestimated. It becomes a tedious task and is plain "hard work."

None of the above methodological problems and potential biases, however, would appear to distort the results consistently in the "no difference" direction. The Environmental Force Unit itself may be insufficient as a measure of the interaction of child and environment. While it can be viewed as recording the verbal interactions rather efficiently, its detection of subtle non-verbal interactions and its failure

to capture the range of affect inherent in all interactions severely limit its uses especially in interactions involving "disturbance" where affect plays a major role. This investigator knows of no single instrument which successfully captures all aspects of an interaction including a range of affect. Perhaps an interaction analysis system using a quick and convenient numeric code for recording affective and non-verbal aspects of interactions might be used in tandum with the EFU system in analyzing a specimen record. Though this author knows of no other study which attempted to find statistical differences between groups using the EFU as a measure, with the exception of Schoggen (1968) who also found no differences, other authors (Schoggen, 1963; Gump, Schoggen & Redl, 1963) have used the percentages and absolute numbers of EFU's to distinguish between groups. If these figures were subjected to a statistical test, they also might prove to be insignificant differences. The ever present problems of observer bias, coder reliability or sample representativeness might well account for differences they have obtained. The small samples involved in these studies (1 to 16 subjects) also leads one to interpret the results rather conservatively.

Inherent in the task of categorizing EFU's, as with any measurement device, is a loss of information and it may be this subtle affective aspect of interaction which suffers most in the process of categorization. The affective differences present between two peers arguing over a crayon and a teacher confronting a child with a wrongdoing tend to be

lost as both interactions fall into the "conflict" category. While some conflictual interactions are considered "normal" and even healthy, differences in the quality and quantity of such interactions often are the chief characteristic in "deviant behavior." Very few persons perceived as deviant engage in behavior which is totally alien to a normal behavioral repetoire. It is the quality or intensity with which the behavior is expressed, its quantity (frequency), or its patterning which identify it as "different." The differentiation of behaviors and the effect of environmental interaction must depend upon the development of instruments sensitive to these qualitative variables.

The fact that the Environmental Force Unit on two occasions did distinguish in even an extremely limited degree between the two types of behavioral settings may be suggestive. It would seem to indicate that further research be done to determine the use of Environmental Force Units in the objective identification and description of environmental settings. Instead of using the EFU to distinguish between individuals, it may be more suited to distinguishing between settings. The results of this study in this regard are corroborated by the findings of Barker (1968) and Gump (1961). Too often, those responsible for providing and maintaining settings for children (i.e., schools, day care centers, playgrounds, etc.) are content to describe the types of experience gained there by children in terms of the training of the professional staff or in ambiguous terms such as "free play," class lesson, etc. The EFU may provide an opportunity for on-going

evaluation of settings by capturing the specific types of interactions occurring there in a quantifiable manner. Through this instrument one may measure the nature of interactions occurring as well as identify the environmental agents and their characteristic methods. The EFU and its use in this manner provides many opportunities for future study.

Implications Of The Study For Ecological Psychology

The nature of ecological methodology and its tremendous logistical requirements would imply that such research be of a long term nature. The emphasis should be upon on-going data collection in depth in a few localities rather than upon short term studies with a sampling technique. It may be that the methods and goals of ecological psychology are incompatible with traditional sampling procedures. This may imply the use of the "field station" concept previously mentioned. While sampling attempts to make generalizations about populations on the basis of sample representativeness and probability curves, ecological methods attempt to formulate general principles through in-depth study of one sample. Ecological methodology seems more related to the methods of anthropology and ethology and their emphasis upon the process rather than the content of behavior than to psychology and its content focus. Such an emphasis is used to justify the lack of representativeness. Ecological psychology can, however, become much more credible if care is taken to choose the select samples from environments less divergent from the mainstream of culture (as in the case of rural Kansas).

Long term and in-depth study in fewer localities would also overcome some of the methodological concerns. Observers could become better trained, more highly skilled and less obtrusive if such studies were centralized and on-going. Indeed, the direction taken by Barker and his field station concept would seem to be correct in light of this study.

The potential the Environmental Force Unit may have in the description of behavior settings may offer a means of quantifying and analyzing differences between behavior settings which heretofore relied upon intuitive judgments or categorical systems in which much data was lost (as in an Interaction Analysis approach). It could be used as one of a series of measures to describe a setting and the interaction of that setting with individuals. Other measures to be used in conjunction with it may include means of mapping the physical environment, traditional case history approaches and innovative methods for measuring the affective content of interactions.

The experience of the investigator with the observers who were trained to take specimen records leads to a conclusion that such training has a serendipitous effect applicable for pre-service training programs for professionals who will deal with children. The careful observation required by the methodology, its specific focus and its technique for transferring the observation experience to written form proved to be stimulating and learning-filled tasks for the observers. Their unsolicited and independent comments were unanimously enthusiastic about their observations as learning

experiences for them about children, "emotional disturbance" and its relationship to teacher or peer behavior, and the general dynamics of a classroom. This technique might be well used in the initial training experiences of teachers, psychologists or others who must develop an understanding of and sensitivity to child behavior. Such techniques, as a method of feedback for in-service training, might be explored but its limitation in terms of time lapse between observation and results are a limitation in feedback procedures.

In light of experiences in this study, this investigator would view the "status" of the four principles of "ecological psychology" identified in the literature review as follows:

1. The importance of observing human behavior in its natural setting presents considerable methodological and ethical problems but ones which may be overcome. The development of innovative measuring techniques and methods of analysis may aid in freeing this approach from the restrictive parameters of traditional statistical procedures. The "field station" concept in studying behavior with an intensive and long-range focus seems to be a step in the right direction.
2. The focus upon the interactive nature of behavior has not yet been fully realized. Though present techniques attempt to study the interaction, they appear to eliminate critical aspects of the

interaction such as affect.

3. The influence of setting upon behavior is perhaps the best developed area in ecological psychology. The methodologies presently available such as the EFU seem to be effective descriptions of this phenomenon. It is the task of formulating the principles and processes involved in this influence of setting which awaits. From these efforts may come the, as yet, unborn "ecological intervention strategies."
4. The development of a methodology which will objectify and quantify observational data has a good beginning in Barker's observational techniques. Care must be taken, however, to combine these techniques with other tools to gain as comprehensive a view of individual and setting as possible.

The task of ecological psychology would seem to lie in the further identification of all aspects of setting and its interaction with the individual. Not only must techniques be devised for determining these qualitative aspects of interactive behavior but means must be found to differentiate the various levels of intensity with which these variables interact. It is to this task that this study addressed itself.

APPENDIX A

June 7, 1971. We are observing in Clara Barton Elementary School. We are presently observing Subject 16 in the third grade. The situation is a non-choice one. The following is that observation:

Observer 1.

10:30

Subject 16 is doing his math.

The teacher is instructing a portion of the class in math, while the rest of the students have been instructed to do their own work at their own seats.

The Subject is now leaning over his paper, apparently working.

The teacher has given special instructions to him that when he finishes with his math he can work with the multiplication cards or the addition card, whichever he feels he needs.

Presently he's just working with the problems at hand.

One of the boys seated next to him says, "What did you say?" to the Subject.

EFU Boy: S to Answer

The Subject ignores him, and just continues to work quietly at his desk, says nothing to the boy who's just asked a question of him.

The Subject is making some numbers down the side column on his paper. He looks over to the boy seated at his left to see if perhaps he's following the instructions correctly; now he looks back to his own paper and continues to number down the side of the paper.

The boy seated next to him leans over and says something to him. The Subject fails to look up at him, he only shrugs his shoulders and continues with his work, seemingly ignoring the boy, at least for the present.

EFU 2 Boy: S to answer question

"Did you do the problems?" the Subject says to the boy seated next to him. The other boy nods his head, in affirmative.

Now the Subject gets up from his desk.

He looks over quickly toward the observers, now he walks toward the back of the room.

He walks over to the drinking fountain, gets a drink.

He starts his return trip back to the desk; he walks back to the desk, pulls the chair out, sits down, slides the chair in close to the desk, and once again begins to lean over his work and prepare to continue with math problems.

The Subject finishes the numbering and now draws a line, a neat line, slightly to the right of the numbering to create a nice margin.

He brushes the hair out of his eyes, looks up for a moment to the other side of the room, watches some of the activity of some of the children, a couple of boys talking.

He watches them rather curiously, interestedly; now he returns his glance once again back to his own paper.

He leans over his paper once again and becomes involved in his work.

The Subject seems to be able to easily fall into his work; he seems quite interested in it, quite involved in it, compared to some of the other students who are still fussing, still perhaps just getting themselves ready to start their work, or else they're flitting about the room or talking to their neighbor.

The Subject seems able to work easily on his own. The teacher, as I say, is working with other students.

The teacher at the moment has just said something to the boy seated next to him, and he looks over toward the boy for a moment, perhaps just to observe his reaction to the teacher.

But once again he returns quickly to his own work, leans over the paper once again and continues to write on the paper.

10:32

Once again the teacher says something to the boy seated next to the Subject.

This time he takes no notice, he just continues to hover over his paper, continuing to write, preparing for various answers he's going to give--apparently he's numbering the paper for subsequent answers from his textbook.

The Subject looks up for a moment toward the blackboard to check out the instructions, the page of the assignment, and so forth.

Now he looks down toward his paper once again, continues to write with his pencil.

The Subject then looks up toward the blackboard in the direction of where the assignment is written.

Again he returns his glance to his own paper.

The Subject looks up once for a moment toward the other side of the class where the teacher is working with other students on their math problems.

He looks over toward the blackboard directly behind the teacher where she's written some of the problems that the other students are doing.

He looks down toward his own paper, and resumes his writing and his work.

The Subject looks up once again at the blackboard, pushes the hair out of his face.

He now looks down toward his textbook; he takes his index finger and marks the first problem with his finger to know where he is on the page.

Now he takes the instruction sheet and slides it over the textbook so as to be able to just pull it down over each successive problem, so he can easily find the problem to answer and he begins his work, starting to do the individual problems.

10:33

Several students are walking, filing past the other side of the room, since the doors give an access to other rooms, arranged in such a way the children have to walk through the room to go from one room to another.

The Subject looks up for a moment, observes them, apparently distracted by the shuffle of feet.

He shifts his chair back, away from his table.

Now he pulls it forward once again, rearranges himself in the seat, leans over his paper and starts to work once again.

He has apparently finished the answers of one of the instruction sheets.

He picks it up, gets out of his seat now, walks over to the teacher's desk.

He says, "I finished it."

The teacher says, "Put it on the desk," and he looks at her for a moment and puts it on top of the desk.

He stands there for a moment, hesitating, perhaps thinking she's to give him another instruction.

Then he whirls around and starts to walk back toward his own seat.

EFU 3 Teacher: Subject to follow directions

He walks toward his own desk, or table; hesitates for a moment.

Now he walks around back toward another table, slightly to the left of the teacher's desk and he starts to go through some papers there.

He finds apparently another set of instructions, math problems, and takes the new sheet of paper and walks back to his own seat.

He sits there in the wrong seat, the seat next to his own, and realizes his mistake, then gets up and rearranges himself and sits himself at his own seat.

He puts the sheet of paper out in front of him, picks up his pencil as though he's prepared to start his work again.

He looks over toward the boy seated at his left's paper, leans over it for a moment, examines it, says nothing now, and returns to his own paper.

The Subject takes the new instruction sheet and holds it up for a moment, examines it, now he places it down on the table and starts to do the work.

The Subject seems to have considerable interest in his work; he seems to be more productive than most of the students around him.

He seems to be able to concentrate easily and works well on his own.

Most of the students are, who have been told to work at their desks, are not doing very well, they're talking to neighbors or looking about the room, involved in other activities, most of them easily distracted.

The Subject, on the other hand, seems to be able to handle the assignment at his desk very easily.

He looks up for a moment from his own paper over toward the boy seated next to him once again, peers over his shoulder, looks at his paper, now he looks back toward his own paper.

10:36

The Subject starts to renumber his paper, as he had earlier.

He looks up for a moment as a boy walks by his desk, now back down toward his own paper and continues to number the margin side of the paper.

The boy looks over his shoulder for a moment, says something to him.

The Subject once again looks up and also says something in return.

He continues to talk.

Now he turns around and says something to the boy seated at his left.

The boy who is standing sits down now at the Subject's right and they continue to talk.

EFU 4 Boys: S to converse

The other boy leans over and cups his mouth with his hand as though to talk more confidentially to the Subject.

The other boy apparently finished his conversation, he gets up and moves away.

The Subject now goes back to his work and continues to number his paper.

1[illegible]:37

The Subject begins to examine his instruction sheet now.

Now he looks down toward his own paper

He looks up for a moment toward the girl seated across from him; he's watching her, watching and looking about the room now, observing the activity going on.

10:38

The Subject continues to examine the activity in the room.

He's gazing almost indifferently, aimlessly about the room, without really selecting any one activity to concentrate on; his eyes seem to just momentarily glance about the room.

He turns to the boy seated at his left and says something to him.

The other boy leans over closer to him to perhaps hear him better.

The Subject continues to talk to the boy although he's also continuing to number his page, working while he's talking at the same time. He's not actually looking at the other boy, only occassionally looks up in the direction of the other boy. Most of the time he's talking and hovering over the paper, looking up only occassionally.

10:39

The Subject holds his instruction sheet up in the air now, glancing from his instruction sheet to his

writing paper, going from question to answer, apparently, with his glance, writing all the while.

A boy in an orange shirt, apparently asks a question of the Subject and the Subject turns to him and says, "WELL, you better solve it yourself. Why don't you go on to the next problem?"

EFU 5 Boy: S to solve problem

The Subject continues to stare at the other boy, as the other boy turns away and apparently taking the advice and starting a new problem.

Now the Subject once again looks back toward his own paper.

10:40

The Subject continues to work with his own problems.

He spreads the paper out with his hands, touches it with his hands, readjusts its position, continues to solve the problems.

He continues to glance continually from instruction sheet to his answer sheet and gaining the gist of the question and then producing an answer on his piece of paper.

Now he's studying the questions on the instruction sheet, nervously twittering with the pencil in his hand as he reads the questions on the instruction sheet.

The Subject looks up for a moment, distracted, as it were, from his work, looks up at a student who is walking by.

He once again looks down toward his own paper, resumes his work, continues working.

10:41

He looks up for a moment toward the blackboard, studies it for a moment, perhaps checking out the assignment.

Now he once again looks down toward his paper, continues his writing, continues to look from his instruction sheet to his paper.

There's a bit of activity occurring in the direction of the observers; some students are questioning our presence, why we're here.

The Subject turns around for a moment to watch this activity.

One of the boys who's just entered into conversation with the observers walks away and the Subject follows him with his eyes as he walks away to his own seat.

The Subject then once again resumes his work, looking down toward his paper and writing with his pencil, apparently resolving some of the problems.

Observer 2.

10:42

He looks at his sheet, concentrating quite hard on what he's doing.

He alternately works a problem, and then sits back and looks at it to see whether he's done it right.

He looks at the teacher, then back at his sheet.

He stands up, bracing one leg against the side of his seat and then sits again.

With his head on his left hand, writes with the right hand.

There is some evidence of restlessness as he slightly taps his right leg.

He doesn't seem too interested any longer in the math work.

He is beginning to be easily distracted by other forces in the classroom.

10:43

Children are moving around, but he pays no attention to them, but he continues to concentrate on his work.

He's chewing gum sort of absentmindedly as he glances at me.

He really isn't interested in the math at all.

Tossing his head lightly to get the hair out of his eyes, he shrugs his shoulders.

By now distracted by what's going on around him, he looks at me, looks at the kid next to him, rattles his pencil, looks back at me again, and shrugs his shoulders.

He seems to be sort of trying to distract himself.

He says something to the boy next to him something unintelligible.

The boy doesn't answer, he leans back in his desk, leans forward again.

He looks at me, grins, picks up his pencil and rattles it.

10:44

He's watching the teacher now, she's helping some of the kids in the class.

He continues to watch her in a very abstracted manner for a long time.

He slouches back in his chair, his left and right legs thrown in front of him.

Looking ahead, he then glances at the ceiling, puts both hands on head.

He makes a mark on the sheet, erases it, makes another mark, busy scribbling.

He gets up, begins to return his paper to the kit box, walks up to the table, there's another boy there.

He says something to the boy next to him there.

He taps with his pencil on his own work sheet.

Says something to himself quietly.

10:45

He leans forward to write, he's got a new sheet of paper now.

His lips move silently as he works.

He reaches down, touches the page with his pencil,

touches his own collar, and alternates chewing his gum and tapping his head.

He leans over, touches the desk of the boy next to him.

Pushing the hair out of his eyes, his head in his left hand, he begins writing again.

10:46

Lifting his head, he stops writing and rests his head again on his left hand.

His "concentrating gesture" seems to be that his left hand shades his eyes.

He's back doing that again.

He begins scribbling, leans back, looks at the sheet.

He writes something on a piece of paper, then something on the worksheet.

He's holding the sheet in his left hand.

He may be bored by it, it may be too easy for him too.

He doesn't seem distracted by any of the other children in the classroom unless he really actively goes out of his way to be distracted.

10:47

He erases, begins to write again, shading his eyes again.

His hand brushes the hair out of eyes.

He begins rocking back and forth in his chair.

He leans back very far in his chair, stretching.

The hand that is shading his eyes moves down to his mouth.

He's moved his left hand now down to the desk and he runs it up and down the side of the desk, tapping absently on the side of the desk.

He looks at me, looks back down at the page, daydreaming again now, looking off into space, not at the teacher, not at anyone.

He seems able to go through the sheets very quickly, one problem after another, when he's not daydreaming.

10:48

He continues to work.

He shades his eyes with his left hand, although there isn't really any direct sunlight. It seems to be a gesture of concentration.

His legs are locked under him in the chair.

He works steadily. He writes rather lightly but I can't tell how large his handwriting is.

He doesn't move, he appears quite relaxed.

10:49

He continues to write with his right hand.

Looking down, he mouths the words silently to himself.

Scratching his head with his right hand, he leans his head on his left hand to see what he's done, leans on his elbow, checking the work on his sheet.

10:50

He writes now without shading his eyes, his left hand is holding the sheet.

Raises his hand to wave the teacher over.

Says something to the teacher as she comes up to him.

She says something back, it may be a correction or just simply a statement of fact.

As the teacher turns and leaves, he continues to work.

She turns and comes back and says, "If you want to you can take the post test, do you want to do that?"

He nods affirmatively.

He gets another worksheet from his desk to take the post test.

He leans over to the desk of the boy next to him, says something to him, the other boy does not respond.

EFU 6 Teacher: S to continue work

He looks around the room, he leans back in his chair, leans forward, picks up his pencil.

His left hand on the desk, he draws a line down the middle of his paper.

Beginning to write now, he numbers down one side of the paper.

Folding the sheet again, he's leaning somewhat on his left elbow.

He writes in what seems to be a light, clear hand, with his right hand.

The noise level in the classroom is slightly higher now.

He makes another line, carefully, down the side of the paper and continues to number.

Standing up, he takes his sheet up to a shelf and places it there.

He stands over by the shelf, evidently chosing another arithmetic sheet.

10:52

Someone is with him now. They're both thumbing through the box.

The Subject picks up something he's dropped and moves back to his seat.

Returning to his seat, he begins to write on a sheet of paper now with his right hand, holding the paper with his left hand.

10:53

A boy comes up sort of to show him what he's doing on his sheet, and the Subject says, "Let's see." The other boy teases, drawing the sheet back.

EFU 7 Boy: S to 'e teased

The Boy moves away, the Subject stands up, watching some other children in the classroom, gets out of his seat, and moves toward the back of the room.

The observation ends.

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